DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CATEGORICAL TANK FARM FACILITY ENTRY AND SURVEILLANCE

Date Approved: 31-Dec-02

Emission Unit Name: TYPE-1, TYPE-2, TYPE-3 **Emission Unit ID** 447

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	Type-1
	HEPA	1	Type-2 and Type-3
	Charcoal filter	1	Type-2 and Type-3

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	GROSS ALPHA/BETA	Annual, unless sspecified by the NOC.

Sampling Requirements: One of the following methods may be chosen for actual emissions reporting: nondestructive assay, record sampler, or continuous air monitoring, whichever is more appropriate.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

06/21/2000 Original approval via AIR 00-604.

09/05/2000 Revision form approved September 5, 2000 to allow and add the description of fixative application.

01/31/2001 Full revision form submitted on January 6, 2001 and approved via AIR 01-103.

12/31/2002 AIR 02-1251, mailed on December 31, 2002 to update Conditions and Limitations to meet Department standards.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 4.90E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 4.90E-02 mrem/year to the Maximally Exposed Individual

(WAC 246-247-030(21)).

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

Categorical approval for facility entry and surveillance. The facilities covered under this NOC will be entered through a door or other existing access location to perform the activities as described below:

Accessing Facilities:
Accessing facilities shall be performed in accordance using the controls determined by the containment matrix from RPP Administration, HNF-IP-0842, Volume VII, Section 3.1, "Radiological Control".

Inspection/Surveillance:

-Visual inspections will be conducted to evaluate facilities integrity for future decommissioning work, to assure that utilities have been shut off, and/or identification of any environmental, radiological, or safety concerns.

Photographing/Videotaping:

-Photographing and videotaping are performed to assist personnel in recording a facility contents and to obtain knowledge of a facility and its contents. Photography/videotaping also assists personnel in planning future decommissioning work.

Sampling/Surveys:

-Swipes, smears, air sampling, and other surveys may be performed to characterize contamination levels present in a facility. These activities may be performed on containers, other equipment and interior surfaces associated with a facility.

-Removal of access port shield plugs may be performed to allow installation of video equipment and/or to perform radiological surveys.

-Electrical equipment inspections may be performed to assure that power has been shut off from facilities or to assure that equipment is in safe operation.

Housekeeping:

-Housekeeping will be performed to assure that a facility is in a safe condition that would not threaten workers safety or the environment. Housekeeping may include collecting containers, or miscellaneous debris for proper disposal.

Fixative Application

-Application of fixative materials serves to reduce the spread of contamination. The process of applying fixative materials varies depending on the type of material being applied. Fixative application may include using a glycerin-based substance followed by a permanent polymer urea based material or the glycerin-based substance alone, or other such process, which do not cause resuspension of smearable contamination.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Alpha - 0	2.80E-04	Beta - 0	4.00E-01	Gamma - 0	4.50E-02

5) **This condition was obsoleted on 9/12/02.** These Conditions and Limitations must be proceduralized prior to starting the activities described in the Notice of Construction

Added by AIR 01-103
Updated to standard condition and limitation via AIR 02-1251.

6) **This condition was obsoleted on 9/12/02.** This approval, with its Conditions and Limitations, constitutes an amendment to the Department's Radioactive Air Emissions License. This amendment must be included in the next revision of the Hanford Air Operating Permit (WAC 246-247-060(1)(e) and (2)(c))

Added by AIR 01-103
Included in Hanford Air Operating Permit issued July, 2002.

7) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

8) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

9) The U.S. DOE shall monitor this emission unit as detailed in the most current PTRAEU Notice of Construction.

10) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).

11) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

12) **This condition was obsoleted on 9/12/02.** The facility must be able to demonstrate the reliability and accuracy of emission data and other test results from this unit (WAC 246-247-075(13) and WAC 246-247-075(6)). The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards listed in, or equivalent to, those listed in the above-cited regulation.

Added by AIR 01-103
Updated to standard condition and limitation via AIR 02-1251.

13) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

14) The department may require an AL:ARACT demonstration at any time (WAC 246-247-080(1)).

15) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

16) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

17) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in

the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

18) **This condition was obsoleted on 9/12/02.** When this project is completed, or operations cease, the facility shall notify the department via a report of closure, including whether or not any potential for airborne release occurred (WAC 246-247-080(6)).
Added by AIR 01-103
Updated to standard condition and limitation via AIR 02-1251.

19) **This condition was obsoleted on 9/12/02.** Records must be readily (promptly) available for this unit. Those records must be maintained onsite, and must be retained for at least five years (WAC 246-247-080(8)).
Added by AIR 01-103
Updated to standard condition and limitation via AIR 02-1251.

20) **This condition was obsoleted on 9/12/02.** This unit must be fully accessible to Department of Health inspectors. If there are any specific training requirements or have restrictions or special requirements for entry, they must be given to the department when they are known to allow for unannounced inspections, as required by EPA (WAC 246-247 080(9)). At a minimum, for unannounced inspections, such requirements or restrictions must be told to inspectors that morning, with the opportunity for the inspectors to meet those requirements. For prior announced inspections, such notification must occur far enough in advance for the inspectors to have reasonable time to meet the requirements.
Added by AIR 01-103
Updated to standard condition and limitation via AIR 02-1251.

21) **This condition was obsoleted on 9/12/02.** The facility shall make requested documents available in a timely manner for review (WAC 246-247-080(10)).
Added by AIR 01-103
Updated to standard condition and limitation via AIR 02-1251.

22) The radiological control technology for all entries conducted under this NOC must follow the containment matrix HNF-IP-0842, Volume VII, Radiological Control.

23) The following radionuclides are allowed under this NOC: 3H, 14C, 59Ni, 60Co, 63Ni, 79Se, 90Sr, 90Y, 93Zr, 93mNb, 99Tc, 106Ru, 113mCd, 125Sb, 126Sn, 129I, 134Cs, 137Cs, 137mBa, 151Sm, 152Eu, 154Eu, 155Eu, 227Ac, 228Ra, 229Th, 231Pa, 232Th, 232U, 233U, 234U, 235U, 236U, 237Np, 238Pu, 238U, 239Pu, 240Pu, 241Am, 241Pu, 242Cm, 243Cm, and 244Cm

24) Whenever active ventilation is in operation, a PTRAEU emission unit must be used as approved by the current PTRAEU NOC. All of the applicable Conditions and Limitations stated for the PTRAEU NOC approval must be adhered to and clearly documented. This includes the emission limits and controls. Emissions from these activities shall be subtracted from the overall handling limit of the PTRAEU NOC and reported under the Categorical Tank Farm Facility Entry and Surveillance NOC.

25) This NOC does not allow any decontaminating and decommissioning work to commence.

26) This NOC is only applicable to tank farm facilities.

27) The annual possession quantity must be tracked for each entry.

28) Activities to this NOC are limited to no more than 2,160 hours/calendar year. This shall be documented on an approved log.

29) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).

30) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

31) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

32) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

    Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

    All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

33) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

34) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

35) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CATEGORICAL TANK FARM FACILITY ENTRY AND SURVEILLANCE

Date Approved: 31-Dec-02

Emission Unit Name: 200 AREA DIFFUSE/FUGITIVE **Emission Unit ID** 486

This is a MAJOR, FUGITIVE, non-point source emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements BARCT ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential TEDE.	As listed in the following Conditions and Limitations.

Sampling Requirements: Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

06/21/2000 Original approval via AIR 00-604.

09/05/2000 Revision form approved September 5, 2000 to allow and add the description of fixative application.

01/31/2001 Full revision form submitted on January 6, 2001 and approved via AIR 01-103.

12/31/2002 AIR 02-1251, mailed on December 31, 2002 to update Conditions and Limitations to meet Department standards.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 4.90E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 4.90E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

Categorical approval for facility entry and surveillance. The facilities covered under this NOC will be entered through a door or other existing access location to perform the activities as described below:

Accessing Facilities:
Accessing facilities shall be performed in accordance using the controls determined by the containment matrix from RPP Administration, HNF-IP-0842, Volume VII, Section 3.1, "Radiological Control".

Inspection/Surveillance:

-Visual inspections will be conducted to evaluate facilities integrity for future decommissioning work, to assure that utilities have been shut off, and/or identification of any environmental, radiological, or safety concerns.

Photographing/Videotaping:

-Photographing and videotaping are performed to assist personnel in recording a facility contents and to obtain knowledge of a facility and its contents. Photography/videotaping also assists personnel in planning future decommissioning work.

Sampling/Surveys:

-Swipes, smears, air sampling, and other surveys may be performed to characterize contamination levels present in a facility. These activities may be performed on containers, other equipment and interior surfaces associated with a facility.

-Removal of access port shield plugs may be performed to allow installation of video equipment and/or to perform radiological surveys.

-Electrical equipment inspections may be performed to assure that power has been shut off from facilities or to assure that equipment is in safe operation.

Housekeeping:

-Housekeeping will be performed to assure that a facility is in a safe condition that would not threaten workers safety or the environment. Housekeeping may include collecting containers, or miscellaneous debris for proper disposal.

Fixative Application

-Application of fixative materials serves to reduce the spread of contamination. The process of applying fixative materials varies depending on the type of material being applied. Fixative application may include using a glycerin-based substance followed by a permanent polymer urea based material or the glycerin-based substance alone, or other such process, which do not cause resuspension of smearable contamination.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Alpha - 0	2.80E-04	Beta 0	4.00E-01	Gamma 0	4.50E-02

5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).

6) **This condition was obsoleted on 9/12/02.** This approval, with its Conditions and Limitations, constitutes an amendment to the Department's Radioactive Air Emissions License. This amendment must be included in the next revision of the Hanford Air Operating Permit (WAC 246-247-060(1)(e) and (2)(c)).
Added by AIR 00-604
Updated to standard condition and limitation via AIR 02-1251.

7) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

8) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

9) **This condition was obsoleted on 1/6/01.** The U.S. DOE shall monitor this project or emission unit as follows: The Department of Health grants approval for the use of the Radiological Containment Matrix Procedure HNF-IP-0842 VII, Radiological Control 3.1. This approval is only granted for this specific NOC within the tank farms and may not be applied to any other NOC with out prior approval from the department.
Added by AIR 00-604

10) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).

11) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

12) **This condition was obsoleted on 9/12/02.** The facility must be able to demonstrate the reliability and accuracy of emission data and other test results from this unit (WAC 246-247-075(13) and WAC 246-247-075(6)). The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards listed in, or equivalent to, those listed in the above-cited regulation.
Added by AIR 00-604
Updated to standard condition and limitation via AIR 02-1251.

13) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

14) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

15) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

16) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

17) **This condition was obsoleted on 9/12/02.** If there is an unexpected release of radioactivity or if

there is a shutdown or other condition that, if it were allowed to persist, would result in emissions of radionuclides in excess of any standards or limitations in the license or that lasts more than four hours, it must be reported to the department within 24 hours.

Added by AIR 00-604
Updated to standard condition and limitation via AIR 02-1251

18) **This condition was obsoleted on 9/12/02.** When this project is completed, or operations cease, the facility shall notify the department via a report of closure, including whether or not any potential for airborne release occurred (WAC 246-247-080(6)).

Added by AIR 00-604
Updated to standard condition and limitation via AIR 02-1251.

19) **This condition was obsoleted on 7/12/00.** The facility must maintain a log in an approved format by the department for these activities or emission units (WAC 246-247-080(7)).

20) **This condition was obsoleted on 9/12/02.** Records must be readily (promptly) available for this unit. Those records must be maintained onsite, and must be retained for at least five years (WAC 246-247-080(8)).

Added by AIR 00-604
Updated to standard condition and limitation via AIR 02-1251.

21) **This condition was obsoleted on 9/12/02.** This unit must be fully accessible to Department of Health inspectors. If there are any specific training requirements or have restrictions or special requirements for entry, they must be given to the department when they are known to allow for unannounced inspections, as required by EPA (WAC 246-247-080(9)). At a minimum, for unannounced inspections, such requirements or restrictions must be told to inspectors that morning, with the opportunity for the inspectors to meet those requirements. For prior announced inspections, such notification must occur far enough in advance for the inspectors to have reasonable time to meet the requirements.

Added by AIR 00-604
Updated to standard condition and limitation via AIR 02-1251.

22) **This condition was obsoleted on 9/12/02.** The facility shall make requested documents available in a timely manner for review (WAC 246-247-080(10)).

Added by AIR 00-604
Updated to standard condition and limitation via AIR 02-1251.

23) The radiological control technology for all entries conducted under this NOC must follow the containment matrix HNF-IP-0842, Volume VII, Radiological Control.

24) The following radionuclides are allowed under this NOC: 3H, 14C, 59Ni, 60Co, 63Ni, 79Se, 90Sr, 90Y, 93Zr, 93mNb, 99Tc, 106Ru, 113mCd, 125Sb, 126Sn, 129I, 134Cs, 137Cs, 137mBa, 151Sm, 152Eu, 154Eu, 155Eu, 227Ac, 228Ra, 229Th, 231Pa, 232Th, 232U, 233U, 234U, 235U, 236U, 237Np, 238Pu, 238U, 239Pu, 240Pu, 241Am, 241Pu, 242Cm, 243Cm, and 244Cm.

25) **This condition was obsoleted on 7/12/00.** The annual possession quantity for each facility entry may not exceed 2.2E-9 Ci Alpha, 3.3E-5 Ci Beta and 2.38E-7 Ci from Cesium.

Added by AIR 00-604

26) **This condition was obsoleted on 1/17/01.** The total abated emission limit for all non-actively ventilated activities is 2.4E-5 mrem/yr. The active ventilated activities must abide by the currently approved Portable/Temporary Radioactive Air Emissions Units (PTRAEU) NOC abated emission limit.

Added by AIR 00-604, Updated to standard condition and limitation via AIR 02-1251.

27) **This condition was obsoleted on 7/12/00.** The periodic confirmatory monitoring and radiological controls must be in accordance with the radiological containment HNF-IP-0842, Volume VII, Radiological Control Matrix.
Added by AIR 00-604

28) **This condition was obsoleted on 1/1/01.** The Department of Health requires an identification number or numbers used to track emission units or activities must be submitted to the department within 60 days from that date of approval.
Added by AIR 00-604

29) Whenever active ventilation is in operation, a PTRAEU emission unit must be used as approved by the current PTRAEU NOC. All of the applicable Conditions and Limitations stated for the PTRAEU NOC approval must be adhered to and clearly documented. This includes the emission limits and controls. Emissions from these activities shall be subtracted from the overall handling limit of the PTRAEU NOC and reported under the Categorical Tank Farm Facility Entry and Surveillance NOC.

30) During facility entries when diffuse/fugitive emissions may occur, surveys/smears and air samples must be conducted and recorded on log sheets or survey reports. These reports and/or survey records must be readily retrievable.

31) This NOC does not allow any decontaminating and decommissioning work to commence.

32) This NOC is only applicable to tank farm facilities.

33) The annual possession quantity must be tracked for each entry.

34) Activities to this NOC are limited to no more than 2,160 hours/calendar year. This shall be documented on an approved log.

35) The facility will maintain a log of all work packages which are used for building access under this NOC (AIR 00-604).

36) **This condition was obsoleted on 1/6/01.** The annual possession quantity for each facility entry may not exceed 2.2E-9 Ci Alpha, 3.3E-5 Ci Beta and 2.38E-7 Ci from cesium. If sample results after entry show that these values have been exceeded, WDOH is to be notified within 24 hours of receipt of the sample results.
New APQ in Revision 2 added by AIR 01-103

37) Facility personnel will determine APQ tracking methodology as required to comply with the approval conditions. APQ will be tracked on the same log sheet used to comply with (WAC 246-247-080(7)).

38) **This condition was obsoleted on 1/6/01.** In addition to those approved activities referenced in the AIR 00-604 conditions, the following activities are also approved:
* Electrical equipment inspections may be performed to assure that power has been shut off from facilities or to assure that equipment is in safe operation.
* Housekeeping will be performed to assure that a facility is in a safe condition that would not threaten workers, safety, or the environment. Housekeeping may include collecting containers or miscellaneous debris for proper disposal.
This was added in Revision 2 by AIR 01-103

39) If sample results after entry show that the APQ have been exceeded, WDOH is to be notified within 24 hours of receipt of the sample results.

40) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

41) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

42) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3), or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

43) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

44) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

45) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

46) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: VAPOR SAMPLING OF MISCELLANEOUS UNDERGROUND UNITS

Date Approved: 31-Dec-02

Emission Unit Name: 200 AREA DIFFUSE/FUGITIVE **Emission Unit ID** 486

This is a MAJOR, FUGITIVE, non-point source emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential TEDE.	As listed in the following Conditions and Limitations.

Sampling Requirements: Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

05/18/2000 Original NOC approved on May 18, 2000 via AIR 00-510.

06/21/2000 NOC Revision Form approved on June 21, 2000.

12/31/2002 AIR 02-1252, mailed on December 31, 2002 to update Conditions and Limitations to meet Department standards.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 5.07E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 5.10E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

performing vapor sampling of miscellaneous underground units with no known path of ventilation. Miscellaneous underground units may include active and inactive underground tanks, wells, and other units with no known path of ventilation.

In addition to vapor sampling activities, this approval allows the possibility of installing temporary or permanent passive HEPA type filtration on any unit if vapor sampling results show combustible gas levels exceeding 25 percent of the lower Flammability Limit (LFL).

Active and Inactive Tanks

Tanks were designed to collect leaks, spills, condensation, and drainage that occurred during operation of tank farm diversion boxes, valve pits, and pipeline encasements. Tanks were also used for settling solids before disposal, neutralizing process wastes, receiving and processing of tank waste, and waste handling and process experimentation. Volumes of waste and constituent concentrations in each tank vary depending on the location in respect to surrounding single and double shell tank farm operations. Most of the tanks are expected to contain low levels of radioactivity.

The tanks are constructed of various materials, which include stainless steel, carbon steel, concrete, and concrete vaults with carbon steel liners. The tank volumes vary in maximum capacity between 50 gallons to 50,000 gallons.

Wells

Wells include structures that were used for the subsurface disposal of waste fluids. Wells that are connected to valve pits or floor drains in contaminated facilities may have received contaminated liquids. Volumes of liquid discharged to these structures and constituent concentrations are unknown.

Combustible gas concentrations in the headspace of miscellaneous units will be field-measured to determine if there are safety concerns associated with combustible gas concentrations. The radiological controls, monitoring, and documentation identified in Sections 2, 3, and 4 of ALARACT 1shall be implemented for access to each unit. Vapor sampling shall be performed in accordance with ALARACT 8, with the exception of bulleted item 5 in Section 2 of the ALARACT. Bulleted item 5 will not be performed because the units are assumed to not be ventilated.

If vapor-sampling results show a combustible gas level measurement exceeding 25 percent of the LFL, a temporary passive HEPA type breather filter may be installed. One of two types of temporary HEPA type filters shall be used. This first type of filter would be mounted onto a plastic bag that could be secured to an access port or riser using tape or some other technique such as banding. The second type of filter would be connected directly to an access port or, in cases where access is through a riser, mounted on a flange that could be bolted onto the riser. These methods allow flammable gases to escape to the atmosphere only through the filter.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Ac - 227	1.06E-02	Am - 241	6.92E+02	Am - 243	3.46E-02
Ba - 137 m	1.61E+05	C - 14	1.04E+01	Cd - 113 m	1.55E+02
Cm - 242	6.08E-01	Cm 243	5.28E-02	Cm - 244	1.98E+00

Co 60	8.66E+02	Cs - 134	3.08E+01	Cs 137	1.70E+05
Eu 152	1.69E+01	Eu - 154	7.23E+03	Eu 155	1.04E+03
H 3	6.46E+01	I - 129	5.16E-01	Nb 93 m	6.32E+01
Ni 59	3.06E+01	Ni - 63	3.01E+03	Np - 237	1.62E+00
Pa - 231	1.61E-02	Pu - 238	2.43E+01	Pu - 239	1.29E+03
Pu 240	2.04E+02	Pu - 241	1.78E+03	Pu - 242	9.94E-03
Ra 226	2.04E-03	Ra - 228	9.82E-02	Ru - 106	1.17E-01
Sb 125	8.63E+02	Se - 79	1.70E+01	Sm - 151	6.36E+04
Sn 126	2.73E+01	Sr - 90	5.23E+06	Tc - 99	5.20E+01
Th - 229	2.27E-03	Th - 232	1.11E-02	U - 232	4.38E+00
U - 233	1.68E+01	U - 234	2.67E+00	U 235	1.06E-01
U 236	8.66E-02	U - 238	2.38E+00	Y - 90	5.23E+06
Zr 93	7.36E+01				

5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).

6) **This condition was obsoleted on 9/12/2002.** This approval, with its Conditions and Limitations, must be included in the next revision of the Hanford Air Operating Permit (WAC 246-247-060(1)(e) and (2)(c)) and will at that time, constitute a revision of the Radioactive Air Emissions License.
Included in Hanford Air Operating Permit issued, July 2001.

7) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

8) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).

10) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

11) **This condition was obsoleted on 9/12/2002.** The facility must be able to demonstrate the reliability and accuracy of emission data and other test results from these units (WAC 246-247-075(13) and WAC 246-247-075(6)). The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards listed in, or equivalent to, those listed in the above cited regulation.
Original NOC approved May 18, 2000 via AIR 00-510.
Updated to new standard Condition/Limitation added via AIR 02-1252.

12) **This condition was obsoleted on 9/12/2002.** The department reserves the right to inspect and audit this unit during operation. This includes all activities, equipment, operation procedures, documents, data, and other records related to compliance with the regulations (WAC 246-247-080(1)).
Original NOC approved May 18, 2000 via AIR 00-510.
Updated to new standard Condition/Limitation added via AIR 02-1252.

13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

15) **This condition was obsoleted on 9/12/2002.** Records must be readily (promptly) available for this unit. Those records must be maintained onsite, and must be retained for at least five years (WAC 246-247-080(8)).

Original NOC approved May 18, 2000 via AIR 00-510.
Updated to new standard Condition/Limitation added via AIR 02-1252.

16) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

17) **This condition was obsoleted on 9/12/2002.** If there is an unexpected release of radioactivity or if there is a shutdown or other condition that, if it were allowed to persist, would result in emissions of radionuclides in excess of any standards or limitations in the license or that lasts more than four hours, it must be reported to the department within 24 hours. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitations included in this approval (paragraph 5).

Original NOC approved May 18, 2000 via AIR 00-510.
Updated to new standard Condition/Limitation added via AIR 02-1252.

18) **This condition was obsoleted on 9/12/2002.** This unit must be fully accessible to Department of Health (DOH) inspectors. If there are any specific training requirements or have restrictions or special requirements for entry, they must be given to the department when they are known to allow for unannounced inspections, as required by EPA (WAC 246-247-080(9)). At a minimum, for unannounced inspections, such requirements or restrictions must be told to inspectors that morning, with the opportunity for the inspectors to meet those requirements. For prior announced inspections, such notification must occur far enough in advance for the inspectors to have reasonable time to meet the requirements.

Original NOC approved May 18, 2000 via AIR 00-510.
Updated to new standard Condition/Limitation added via AIR 02-1252.

19) **This condition was obsoleted on 9/12/2002.** The facility shall make requested documents available for timely review (WAC 246-247-080(10)).

Original NOC approved May 18, 2000 via AIR 00-510.
Updated to new standard Condition/Limitation added via AIR 02-1252

20) **This condition was obsoleted on 9/12/2002.** When this project is completed, or operations cease, the facility shall notify the department via a report of closure, and indicate whether or not any potential for airborne release occurred (WAC 246-247-080(6)).

Original NOC approved May 18, 2000 via AIR 00-510.
Updated to new standard Condition/Limitation added via AIR 02-1252.

21) The work in this NOC is limited to those described activities associated with the construction and operation activities involving Vapor Sampling of Miscellaneous Underground Units With No Known Path of Ventilation.

22) Approved activities included in the process are the following: Sampling of miscellaneous underground units with no known path of ventilation. Miscellaneous underground units may include active and inactive underground tanks, wells, and other units with no known path of ventilation. Installation of temporary or permanent passive HEPA type filtration on any unit if vapor sampling results show

combustible gas levels exceeding 25 percent of the lower flammability limit is approved.

23) The total unabated emissions are limited to 2.02E-02 mrem/year per tank.

24) The total unabated dose TEDE to the hypothetical MEI cannot exceed 1.04 E-05 mrem/year per tank.

25) The following controls must be adhered to:
* ALARACT 8 with the exception of bulleted Items 5 of Section 2

26) **This condition was obsoleted on 9/12/2002.** The annual possession quantity is limited to the radionuclides listed below:

3H: 1.29E-03 Ci/gal; 6.46E+01 Ci
14C: 2.08E-04 Ci/gal; 1.04E+01 Ci
59 Ni: 6.12E-04 Ci/gal; 3.06E+01 Ci
60Co: 1.73E-02 Ci/gal; 8.88E+02 Ci
63Ni: 6.02E-02 Ci/gal; 3.01E+03 Ci
79Se: 3.40E-04 Ci/gal; 1.70E+01 Ci
90Sr: 1.05E+02 Ci/gal; 5.23E+06 Ci
90Y: 1.05E+02 Ci/gal; 5.23E+06 Ci
93Zr: 1.47E-03 Ci/gal; 7.36E+01 Ci
93mNb: 1.26E-03 Ci/gal; 6.32E+01 Ci
99Tc: 1.04E-03 Ci/gal; 6.20E+01 Ci
106Ru: 2.34E-06 Ci/gal; 1.17E-01 Ci
113mCd: 3.10E-03 Ci/gal; 1.55E+02 Ci
125Sb: 1.73E-02 Ci/gal; 8.63E+02 Ci
126Sn: 5.46E-04 Ci/gal; 2.73E+01 Ci
129I: 1.03E-05 Ci/gal; 5.16E-01 Ci
134Cs: 6.15E-04 Ci/gal; 3.08E101 Ci
137Cs: 3.39E+00 Ci/gal; 1.70E+05 Ci
137mBa: 3.22E+00 Ci/gal; 1.61E+06 Ci
151Sm: 1.27E+00 Ci/gal; 6.36E+04E+0 Ci
152Eu: 3.38E-04 Ci/gal; 1.69E+01 Ci
154Eu: 1.45E-01 Ci/gal; 7.23E+03 Ci
155Eu: 2.09E-02 Ci/gal; 1.04E+03 Ci
226Ra: 4.09E-08 Ci/gal; 2.04E-03 Ci
227Ac: 2.12E-07 Ci/gal; 1.06E-02 Ci
228Ra: 1.96E-06 Ci/gal; 9.82E-02 Ci
229Th: 4.54E-08 Ci/gal; 2.27E-03 Ci
231Pa: 3.22E-07 Ci/gal; 1.61E-02 Ci
232Th: 2.22E-07 Ci/gal; 1.11E-02 Ci
232U: 8.76E-05 Ci/gal; 4.38E+00 Ci
233U: 3.37E-04 Ci/gal; 1.68E+01 Ci
234U: 5.34E-05 Ci/gal; 2.67E+00 Ci
235U: 2.11E-06 Ci/gal; 1.06E-01 Ci
236U: 1.73E-06 Ci/gal; 8.66E-02 Ci
237Np: 3.24E-05 Ci/gal; 1.62E+00 Ci
238Pu: 4.86E-04 Ci/gal; 2.43E101 Ci
238U: 4.76E-05 Ci/gal; 2.38E+00 Ci
239Pu: 2.58E-02 Ci/gal; 1.29E+03 Ci

240Pu: 4.07E-03 Ci/gal; 2.04E+02 Ci
241Am: 1.38E-02 Ci/gal; 6.92E+02 Ci
241Pu: 3.55E-02 Ci/gal; 1.78E+03 Ci
242Cm: 1.22E-05 Ci/gal; 6.08E-01 Ci
242Pu: 1.99E-07 Ci/gal; 9.94E-03 Ci
243Am: 6.92E-07 Ci/gal; 3.46E-02 Ci
243Cm: 1.06E-06 Ci/gal; 5.28E-02 Ci
244Cm: 3.97E-05 Ci/gal; 1.98E+00 Ci

Original NOC approved May 18, 2000 via AIR 00-510.
Replaced by new standard Condition/Limitation via AIR 02-1252.

27) **This condition was obsoleted on 6/21/2000.** Vapor space sampling must be in accordance with ALARACT 8.

Original NOC approved May 18, 2000 via AIR 00-510.
Obsoleted on June 21, 2000 per NOC Revision Form.

28) All work on this project must be completed on or before April 1, 2010.

29) Vapor space sampling will follow the controls identified in ALARACT 8, with the exception of bulleted items 4 and 5 in Section 2 of the ALARACT. Bulleted item 4 will not be performed unless field evaluation determines that a riser adapter is necessary to minimize potential exposure to the environment. Installation of an adapter is normally not necessary due to the riser configuration and the short duration required for vapor sampling miscellaneous units. Bulleted item 5 will not be performed because the miscellaneous units are not ventilated.

30) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

31) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

32) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

33) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

34) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

35) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced

inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

36) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

37) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: OPERATION OF THE RADIOLOGICAL COUNTING FACILITY.
Date Approved: 29-Mar-02
Emission Unit Name: RCF-2-EX

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	
	Fan	1	

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93(b)(4)(i) & WAC 246-247-075(3)	Appendix B, Method 114(3)	TOTAL ALPHA TOTAL BETA	quarterly

Sampling Requirements: Record Sample

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

05/04/2000 Revision to original NOC (NOC ID 385) eliminated an emission unit and moved the other emission unit from the 100-N Area to the 300 Area. This revision approved on May 4, 2000 via AIR 00-407.

02/20/2002 NOC Revision Form approved February 20, 2002 to change condition wording. Conditions and Limitations, AIR 02-309, mailed on March 29, 2002.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 7.07E-07 mrem/year to the Maximally Exposed Individual. The total unabated emission limit for this Notice of Construction is limited to 1.41E-03 mrem/year to the Maximally Exposed Individual.

3) **This process is limited to:**

the radiological analyses performed in the RCF are used to identify the need for additional analyses and worker protection or operational decisions. Various types of sample media are prepared and analyzed including soil, groundwater, filters, smears, and miscellaneous materials (e.g., pipe, concrete, clothing, oil, and surface water). In addition, a limited number of radiological standards are prepared each year in the RCF. Each sample is field screened and labeled prior to acceptance into the RCF. The annual sample load through the RCF is expected to be less than 2000 liters of soil, solid, liquid and miscellaneous samples per year. This does not include smears, air filters or any other sample that does not require invasive sample preparation techniques. Sample logs and facility operators verify the annual sample load. No one sample will contain greater than 1,000,000 disintegrations per minute (dpm) alpha and 50,000,000 dpm beta/gamma.

Sample preparation typically involves physical processes (e.g., evaporation of liquids, wet ball milling of soils and other solids, mounting of air filters and other smears, and depositing the prepared material on planchets prior to counting) rather than radiochemistry. Sample preparation activities may be conducted in a High Efficiency Particulate Air (HEPA) filtered ventilated enclosure, depending on the sample activity level or contaminants determined by field screening

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Am	241	3.55E-03
Am	243	1.22E-08
C-	14	2.08E-04
Co	60	8.28E-03
Cs	137	2.14E-02
Eu	152	1.39E-03
Eu	154	7.68E-04
Eu	155	3.64E-04
H-	3	9.92E-04
Ni	63	6.61E-04
Pu	238	6.31E-04
Pu	239	3.68E-03
Pu	240	3.64E-05
Pu	241	9.26E-04
Pu	242	6.29E-13
Ra	226	6.61E-08
Ra	228	2.31E-10
Sr	90	1.79E-02
Tc	99	7.27E-05
Th	228	3.14E-07
Th	232	1.12E-10
U-	234	3.66E-05
U-	235	2.70E-06
U-	236	1.01E-06
U-	238	3.12E-05

5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5) and 246-247-060(5)).

02/28/2002 Updated to new Standard Condition/Limitation

6) **This condition was obsoleted on 02/28/2002.** This approval, with its conditions and Limitations, must be included in the next revision of the Hanford Air Operating Permit (WAC 246-247-060(1)(e) and (2)e)), and will at that time, constitute a revision of the Radioactive Air Emissions License.
Obsoleted by issuance of the Hanford Site Air Operating Permit

7) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060(2)(d)).
02/28/2002 Updated to new Standard Condition/Limitation

8) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
02/28/2002 Updated to new Standard Condition/Limitation

9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
02/28/2002 Updated to new Standard Condition/Limitation

10) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
02/28/2002 Updated to new Standard Condition/Limitation

11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
02/28/2002 Updated to new Standard Condition/Limitation

12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
02/28/2002 Updated to new Standard Condition/Limitation

13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
02/28/2002 Updated to new Standard Condition/Limitation

14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).
02/28/2002 Updated to new Standard Condition/Limitation

15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
02/28/2002 Updated to new Standard Condition/Limitation

16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
02/28/2002 Updated to new Standard Condition/Limitation

17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive

air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with WAC 246-247-080(8)). (WAC 246-247-080(6))

02/28/2002 Updated to new Standard Condition/Limitation

18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

02/28/2002 Updated to new Standard Condition/Limitation

19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

02/28/2002 Updated to new Standard Condition/Limitation

20) Monitoring shall consist of periodic confirmatory monitoring. The samples shall be taken quarterly and sent for analysis.

02/28/2002 Updated to new Standard Condition/Limitation

21) The emissions controls shall include a single HEPA filter in the exhaust duct of the MO-423 Trailer. The exhaust is then pulled through a fan and exits through a rigid duct. The flow rate shall be 600 to 650 CFM(+/- 10%). The HEPA filter shall be efficiency tested annually or after modification or maintenance to the system that violates the integrity of the airflow. The HEPA filters shall be changed as necessary due to pressure gauge readings falling outside the operating range or with the failure of the annual efficiency test (WAC 246-247-075(3)).

22) This NOC approval includes the following activities which might be performed in the RCF which include sample preparation, evaporation of liquids, wet ball milling of soils and other solids, mounting of air filters and other smears. Sample preparation activities may be conducted in a HEPA filtered ventilated enclosure depending on the sample activity level or contaminates determined by field screening. All samples requiring invasive preparation techniques will be handled in the sample preparation room of the MO-423 Trailer, which is exhausted through the HEPA filtered emission unit RCF-2-EX that contains a HEPA filter.

23) The facility must maintain a log in an approved format for this activity or emission unit (WAC 246-247-060(5)).

24) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the

appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).
02/28/2002 Updated to new Standard Condition/Limitation

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: RESEARCH AT THE 326 FACILITY
Date Approved: 22-Jun-01
Emission Unit Name: EP-326-01-S

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **ALARACT** ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	Fan	3	In parallel, common to both areas
Hoods, SEM	HEPA	2	In series
Hot cells and hoods	HEPA	1	

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93[b][4][i] & WAC 246-247-075[3]	Appendix B, Method 114(3)	TOTAL ALPHA TOTAL BETA	2 week sample/year
Sampling Requirements:	Record Sample		

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

06/22/01 Original NOC (Research Activities in the Material Sciences Laboratory (326 Building) 300 Area, Hanford Site, Richland, Washington) submitted to cover all activities being conducted within the 326 Facility. This contains the activity approved on October 17, 2000 via NOC Short Form for Xenon Research (NOC ID 493) and moving the Radon Generator Project from the 329 Building to the 326 Building approved via RTAM on April 11, 2000 (NOC ID 468). These Conditions and Limitations replace those for NOC ID 493 and NOC ID 468. This NOC approved via AIR 01-607 on June 22, 2001.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 8.52E-05 mrem/year to the Maximally Exposed Individual. The total unabated emission limit for this Notice of Construction is limited to 8.15E-03 mrem/year to the Maximally Exposed Individual.

3) **This process is limited to:**

the following type of research activities within the 326 Facility.

Development and calibration of fiber optic chemical sensors, electrical and mechanical engineering support for nuclear instrumentation development and fabrication, design and engineering of special purpose radiation detectors and sampling systems, and operation of a continuous glass fiber draw capability to produce neutron sensitive scintillating glass fiber which is a new class of solid state radiation detectors.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Ag	110	m	2.00E-02
Am	241		2.00E-04
Ar	37		6.00E-07
Ar	39		6.00E-07
Ar	41		6.00E-07
Ba	133		2.00E-02
C-	14		2.00E-03
Ca	45		6.00E-01
Cd	109		6.00E-04
Ce	144		2.00E-01
Cf	252		7.00E-05
Cm	244		1.00E-05
Co	56		3.00E+00
Co	57		6.00E-01
Co	58		1.50E+00
Co	60		4.50E+00
Cr	51		6.00E+00
Cs	134		1.00E-02
Cs	137		1.00E-05
Cu	64		6.00E+01
Eu	152		4.00E-03
Eu	154		3.00E-03
Eu	155		2.00E-01
Fe	55		1.00E+02
Gd	149		6.00E-01
Gd	151		6.00E-01
H-	3		6.00E-01
I-	125		5.70E-07
I-	129		5.00E-11
I-	131		1.00E-08
Mn	54		7.00E+00
Mo	93		6.00E-01
Nb	93	m	9.00E-01
Nb	94		6.00E-01
Ni	59		6.00E+00
Ni	63		1.50E+00
Pu	238		6.00E-07

Pu	239		8.00E-07
Ra	226		1.22E-04
Ru	106		2.00E-01
Sb	124		1.00E-01
Sb	125		3.00E-02
Sc	46		6.00E-01
Sn	113		6.00E-03
Sn	119	m	2.00E-02
Sn	123		1.00E-01
Sr	85		6.00E-04
Sr	89		2.00E-03
Sr	90		1.00E-05
Ta	179		2.00E-03
Ta	182		7.00E-01
Tc	99		7.00E-01
Te	123		1.00E-04
Th	230		2.00E-05
U-	235		1.00E-01
U-	238		9.00E-07
V-	49		6.00E-01
W-	181		1.00E+00
W-	185		6.00E+00
Xe	131	m	3.00E-04
Xe	133		2.00E-05
Xe	133		2.00E-05
Xe	135		1.00E-05
Zn	65		6.00E-01
Zr	95		1.00E-02

5) These Conditions and Limitations must be proceduralized prior to starting the activities described in the Notice of Construction.

6) This approval, with its Conditions and Limitations, constitutes an amendment to the Department's Radioactive Air Emission License, and must be included in the next revision of the Hanford Air Operating Permit (WAC 246-247-060(1)(e) and (2)(e).

7) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

8) The department reserves the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(10) and (11).

9) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

10) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13) and WAC 246-247-075(6)).

11) The department reserves the right to inspect and audit this emission unit during construction and operation, including all activities, equipment, operations, documents, data, and other records related to compliance with (WAC 246-247-080(1)).

12) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards.

13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

14) All reports and records must be kept and reported according to 40 CFR 61, Subpart H (WAC 246-247-080(2)).

15) All measured or calculated emissions must be reported annually (WAC 246-247-080(3)).

16) When this project is complete, or operations cease, the facility must notify the department via a report of closure, including whether or not any potential for airborne releases occurred (WAC 246-247-080(5)).

17) The facility shall make requested documents available in a timely manner for review (WAC 246-247-080(10)).

18) This unit must be fully accessible to Department of Health inspectors. Any specific training requirements, restrictions or special entry requirements must be given to the department when known to allow for unannounced inspections, as required by (WAC 246-247-080(9)).

19) Records must be readily (promptly) available for this unit. Those records must be maintained onsite, and must be retained for at least five years (WAC 246-247-080(8)).

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
LICENSE AMENDMENT FOR

PROJECT TITLE: T PLANT COMPLEX FUEL REMOVAL PROJECT
Date Approved: 16-Oct-01
Emission Unit Name: 291-T-1

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: ALARACT

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	Prefilter	1	
	HEPA	2	In series
	Fan	3	2 in series, 2 parallel (two fans operate while the third fan is a backup)

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93[b][4][i] & WAC 246-247-075[3]	Appendix B, Method 114(3)	TOTAL ALPHA TOTAL BETA	4 week sample/ year
Sampling Requirements:	Record Sample		

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

05/15/01 NOC revision form submitted and approved on May 15, 2001 during RTAM for two condition changes. New Conditions/Limitations issued via AIR 01-1010 dated October 16, 2001.

03/16/01 The T Plant Complex Fuel Removal Project (Revision 0, DOE/RL-2000-64) was initially received November 27, 2000. Information request resulted in issuance of revised NOC (Revision 1, DOE/RL-2000-64) approved on March 16, 2001 via AIR 01-306.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 8.00E-09 mrem/year to the Maximally Exposed Individual. The total unabated emission limit for this Notice of Construction is limited to 1.60E-05 mrem/year to the Maximally Exposed Individual.

3) **This process is limited to:**

a) Remove all spent nuclear fuel assemblies from the spent fuel pool in the T Plant Complex 221-T Canyon for interim storage in the Canister Storage Building. The activities required for fuel removal are limited to the following:

(i) Retrieval of PWR-2 fuel assemblies from their current pool storage racks in the 221-T Building.

(ii) Insertion of PWR-2 fuel assemblies into Shippingport Spent Fuel Containers (SSFCs) and closure with shield plugs.

(iii) Fuel conditioning within the SSFCs. This included the drying of the fuel, and replacing the air inside the SSFCs with an inert atmosphere.

(iv) Transfer of the SSFCs to the CSB.

b) The chemical and physical processes associated with the T Plant Complex Fuel Removal Project are limited to the following:

(i) The SSFCs (with inserts installed), shield plugs, shield plug seals, and required tools will be staged at the T Plant Complex. The skid-mounted fuel conditioning system will be placed in the 221-T Tunnel.

(ii) The SSFCs/cask/transporter will be moved into the 221-T Tunnel and the loading guide will be installed into the SSFCs.

(iii) The hoist will be moved to the spent fuel pool using the canyon bridge crane to position. The fuel assembly will be grappled remotely, raised from the pool, and the fuel assembly identification number will be recorded.

(iv) The fuel assembly will be transferred over the cell partition and lowered into the SSFCs. After four fuel assemblies are placed into an SSFCs, the shield plug will be installed and the SSFCs will be sealed mechanically.

(v) The SSFCs will remain on the transporter trailer during loading and conditioning operations within the fuel transport cask, and will be connected to the fuel conditioning system via the process port on the shield plug. The SSFCs will be conditioned by pulling a vacuum to dry the fuel, backfilling with helium, pulling a vacuum again, and refilling the SSFCs with helium to inert the atmosphere surrounding the fuel. The SSFCs will be leak tested to verify closure and the process port cover plate will be closed.

(vi) The cask lid will be placed on the cask and bolted in place (airtight) and the cask will be transported to the CSB. After off-loading the SSFCs at the CSB, the cask and transporter will be returned to the 221-T Tunnel. It will take 18 trips to transfer the 72 fuel assemblies.

(vii) The transport cask must be designed to preclude the potential release of radioactive emissions.

(viii) The fuel conditioning system skid will be dismantled and removed from the 221-T Canyon.

4) Proceduralize these conditions and limitations prior to starting the activities described in the Notice of

Construction.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

5) If this emission unit is not in compliance with the standards in WAC 245-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

6) This approval, with its Conditions and Limitations, constitutes an amendment to the Departments' Radioactive Air Emissions License, and must be included in the next revision of the Hanford Air Operating Permit (WAC 246-247-060(1)(e) and (2) and will at that time constitute a revision of the Radioactive Air Emissions License.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission units' control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

8) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(10) and (11)).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

9) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

10) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13) and (WAC 246-247-075(6)).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

11) The department reserves the right to inspect and audit this emission unit during construction and operation including all activities, equipment, operations, documents, data, and other records related to compliance with (WAC 246-247-080(1)).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

12) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

14) Keep all reports and records according to 40 CFR 61, Subpart II (WAC 246-247-080(2)).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

15) Report all measured or calculated emissions annually (WAC 246-247-080(3)).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

16) Any unexpected release of radioactivity, shutdown or other condition that if allowed to persist, would result in the emission of radionuclides in excess of any standards or limitation in the license, or that lasts more than four hours, must be reported to the department within 24 hours. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5),), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4) whichever is applicable, or any limitation included in this approval (paragraph 5).

Condition/Limitation added via AIR 01-306 dated March 16, 2001.

17) **This condition was obsoleted on 10/10/2001.** When this project is complete, or operations cease, the facility must notify the department via a report of closure, including whether or not any potential for airborne releases occurred (WAC 246-247-080(6)).
Replaced by new sunset Condition/Limitation.

18) The facility shall make requested documents available in a timely manner for review (WAC 246-247-080(10)).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

19) This unit must be fully accessible to Department of Health inspectors. Any specific training requirements, restrictions or special entry requirements must be given to the department when known to allow for unannounced inspections, as required by EPA (WAC 246-247-080(9)). At a minimum, for unannounced inspections, such requirements or restrictions must be told to inspectors that morning, with the opportunity for the inspectors to meet those requirements. For prior announced inspections, notification must occur far enough in advance for the inspectors to have reasonable time to meet the requirements.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

20) Records must be readily (promptly) available for this unit. Those records must be maintained onsite for at least five years (WAC 246-247-080(8)).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

21) The scope of the T Plant Complex Fuel Removal Project is limited to the activities required to prepare for, and perform fuel handling, canister loading, canister drying and creating an inert atmosphere inside the canister, and cask loading within the 221-T Canyon, and subsequent cask transportation to the Canister Storage Building (CSB).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

22) The removal activities covered under this NOC are limited to the 72 PWR-2 fuel assemblies currently in the 221-T spent fuel pool.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

23) The transport cask must be designed to preclude the potential release of radioactive emissions.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

24) **This condition was obsoleted on 05/15/2001.** The spent fuel pool ion exchange system must be reactivated and placed in service before removal of the fuel assemblies to increase water clarity. The pool water chemistry and depth must be maintained and monitored while the PWR-2 fuel is removed.
Condition/Limitation obsoleted and replaced to reflect change approved via NOC Application/Permit Revision form dated May 15, 2001.

25) **This condition was obsoleted on 05/15/2001.** Monitor at least monthly the water quality of the spent fuel pool for Cobalt-60 and Cesium-137. The low radionuclide concentrations are evidence that the integrity of the fuel cladding is intact. Notify DOH immediately if the activity levels of the water increases during fuel removal to a level greater than two times the established levels for the pool.
Condition/Limitation obsoleted and replaced to reflect change approved via NOC Application/Permit Revision form dated May 15, 2001.

26) Upon completion of the project, the pool water will be pumped out and transferred (e.g. tanker trucks or hard piping) to a permitted liquid waste treatment/disposal facility. No other decontamination activities of the spent fuel pool are permitted within the scope of this NOC.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

27) As described in the NOC, compliance to ASME/ANSI AG-1 is limited to the replacement of HEPA filters in the ventilation systems. Replacement filters must meet the qualifications testing of AG-1 and

deviations approved by DOH.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

28) The fans and motors shall be maintained by regular visual inspection and maintenance. The fans and motors shall be inspected for operational variables such as abnormal noise, excessive vibration, and fan bearing temperatures, and be lubricated as needed. Inspection and maintenance activities shall be conducted on a schedule approved by DOH.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

29) T Plant must continue to demonstrate that the adequacy of their system design and operation is equivalent to the intent of ASME/ANSI N 510. Both stages of HEPA filtration must be individually aerosol tested in place, a minimum of annually (at a minimum-control efficiency of 99.95 percent).
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

30) This annual inspection and maintenance of the HEPAs must include visual inspection of the filter housing. Documentation of these activities must be made available to DOH upon request.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

31) The adequacy of the sampling system must be maintained by a minimum of annual inspections, calibrations and maintenance activities as scheduled in the T Plant facility procedures. The frequency of these activities cannot be diminished from their current approved level without concurrence from WDOH.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

32) The Quality Assurance Standards for the sampling of emissions and subsequent analysis must remain in compliance with HNF-0528-3 NESHAPS Quality Assurance Project Plan for Radioactive Airborne (all of sections 2.0, 3.0, 5.0). This plan was written to show compliance to applicable NQA-1 requirements.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

33) T Plant must continue to test stack flow according to 40 CFR 60, Appendix A Methods 1 and 2. Methods 1A, 2A, 2C and 2D are not applicable to the stack dimensions and design. The relative humidity must be measured with a calibrated hygrometer or with wet and dry bulb readings as allowed in Method 2. Methods 4, 5 and 17 are not applicable to radioactive airborne effluent stacks.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

34) The stack must be operated to maintain near isokinetic sampling.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

35) Calibrate all differential pressure gauges associated with 291-T-1 HEPA filters annually.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

36) The radionuclides of concern for this fuel removal project NOC are Iron-55, Cobalt-60, Nickel- 63, Strontium-90, and Plutonium-238 from the crud (external surface contamination on the fuel assemblies) Cobalt-60 and Cesium-137 in the pool water.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

37) Compliance to the technology standards is applicable only to this NOC. Future NOC's must show a higher degree of documentation and evidence of compliance to the standards.
Condition/Limitation added via AIR 01-306 dated March 16, 2001.

38) The spent fuel pool filtration system must be reactivated and placed in service before removal of the fuel assemblies to increase water clarity. The pool water chemistry must be maintained and monitored while the PWR-2 fuel is removed.
Condition added per NOC Application/Permit Revision via AIR 01-1010 dated October 16, 2001.

39) Monitor at least monthly the water quality of the spent fuel pool for Cobalt-60 and Cesium-137. The low radionuclide concentrations are evidence that the integrity of the fuel cladding is intact. Notify

DOH immediately if the activity levels of the water increase during fuel removal to a level greater than two times the established levels (0.01 microcuries per milliliter) for the pool, i.e., 0.02 microcuries per milliliter.

Condition added per NOC Application/Permit Revision via AIR 01-1010 dated October 16, 2001.

40) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting, requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

Condition added to reflect current sunset language via AIR 01-1010 dated October 16, 2001.

Approval Number: AIR 02-704 NOC ID: 500

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: ENTERING AND CHARACTERIZING OF THE 224-T FACILITY PROCESS CELLS

Date Approved: 25-Jul-02
Emission Unit Name: 291-T-1

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **ALARACT** ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	Prefilter	1	
	HEPA	2	In series
	Fan	3	2 in series, 2 parallel (two fans operate while the third fan is a backup)

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93[b][4][i] & WAC 246-247-075[3]	Appendix B, Method 114(3)	TOTAL ALPHA TOTAL BETA	Particulates shall be continuously sampled and analyzed every two-weeks for gross alpha and gross beta, composited on a quarterly basis and analyzed isotopically.

Sampling Requirements: Record Sample

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

09/18/2001 NOC Revision Form DOE/RL-2001-19, Revision 1B, approved September 18, 2001 to provide process description change.

05/10/2002 NOC Revision form, DOE/RL-2001-19, Rev. 1C, approved on May 10, 2002 to provide changes to sections 5 and 10. Approval letter, AIR 02-704, mailed on July 25, 2002.

06/11/2001 NOC DOE/RL-2001-19, Revision 0, approved on June 11, 2001 via AIR 01-602.

07/02/2001 NOC Revision form DOE/RL-2001-19, Revision 1A, approved July 2, 2001 to provide process and condition changes.

Printed on 25-Jul-02

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 1.25E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 1.25E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

3) **This process is limited to:**
entering the 224-T Facility to determine the condition and contents of the facility's cells, tanks, and vessels.

A containment tent shall be erected outside each access door. The containment tent shall consist of two or more chambers, where the inner chamber shall surround the cell door and the outer chamber shall function as an airlock. Alpha and beta continuous air monitors (CAM) shall monitor each chamber and shall run continuously whenever the cell door is open. The inner chamber shall be fitted with a Type I portable temporary radioactive air emissions unit (PTRAEU) exhauster to provide air flow and contamination control in the containment tent. The exhauster shall be run intermittently to control radiological conditions, at the direction of the field work supervisor in collaboration with the health physics technician (HPT). The containment tent shall be isolated from the cell (door closed or otherwise blocked) before operating the exhauster. The Type I PTRAEU shall be used in accordance with the conditions, controls, monitoring requirements and limitations of the latest approved revision of the PTRAEU NOC (DOE/RL-96-75).

The following characterization activities are allowed in the cells and/or containment tent:

a. Establishing radiological conditions/map (i.e., dose rates, smearable and fixed contamination, and airborne concentrations);
b. Nondestructive data analyses (NDA) measurements of equipment;
c. Collection of liquid and solid samples from open vessels, trenches, or sumps;
d. Collection of ultrasonic data on vessels and piping;
e. Taking photographs;
f. Performing visual inspections;
g. Removing flanges to collect samples from inside equipment or piping;
h. Cutting or drilling into piping to collect samples with appropriate equipment such as a reciprocating saw, a circular saw, a hacksaw, a tri-tool, or an abrasive wheel;
i. Minor decontamination activities such as wiping down, applying fixatives or sealants, etc., performed in the cell or in the containment tent. Decontamination to reduce dose rates or remove contamination for personnel safety, to remove characterization equipment brought in, or to remove incidental loose equipment or waste found in the cell;
j. Size reduction and packaging and containerizing of incidental, loose equipment or waste found in the cell for removal and/or disposal;

k. Removal of infiltrated water from the pit and the submerged tanks in C-Cell by pumping into tanker trucks for subsequent disposal;
l. Characterization of the removed water prior to disposal;
m. Investigation of the source of water infiltrated into C-Cell; and
n. Sealing and grouting of leaks causing water infiltration.

A small amount of excavation is allowed to take place around the cell access doors to support installation of the containment tents. Manual digging methods with shovels, picks and rakes shall be used. Up to two cubic meters of contaminated soil may be disturbed.

Within the containment tent, the weather barrier cover over the cell access door shall be removed. The integrity and functionality of the cell door shall be determined and as a result the door may be removed and replaced with another door. Any other physical barrier that limits access to the cell also shall be removed.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Alpha 0	2.46E+01
Beta 0	5.84E+00

5) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

6) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

7) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10).

8) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

9) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

10) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

11) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

12) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

13) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

14) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

15) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable

standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

16) **This condition was obsoleted on 11/9/2001.** When this project is complete, or operations cease, the facility must notify the department via a report of closure, including whether or not any potential for airborne releases occurred (WAC 246-247-080(6)).
Condition replaced by new standard condition

17) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

18) All work covered by this NOC must be completed by December 31, 2005.

19) These conditions and limitations must be proceduralized prior to starting activities granted by this approval.

20) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

21) No more than two cells shall be entered at one time. The containment tent shall be operated in such a manner that no air will be drawn from a cell into the containment tent when the cell door is open. The Type I PTRAEU ventilating the containment tent for a cell shall be turned on only when the cell entrance is closed or otherwise blocked to provide isolation from the process cell.

22) The dose to the maximally exposed member of the public from unabated emissions from sampling and characterization activities covered by this NOC shall not exceed 8.31E-03 mrem/year from the 291-T-1 emission point.

23) HPT coverage shall be provided during all cell entries and excavation activities.

24) Before starting work on removing flanges or cutting pipe, removable contamination in the affected area shall be reduced to ALARA. Measures such as expandable foam, fixatives, or glovebags applied on or around a pipe cut shall also be considered to help fix contamination.

25) When a HEPA Filtered Vacuum Radioactive Air Emission Unit (HEPA VAC) is used, the conditions, controls, monitoring requirements and limitations of the latest approved revision of the HEPA VAC Notice of Construction shall be required.

26) The existing emissions controls at the 291-T-1 stack shall be used to abate characterization releases with the potential to challenge those controls. The 291-T-1 stack controls shall consist of a prefilter and two stages of (HEPA) filters. The HEPA filters shall be tested in place annually to verify a minimum control efficiency of 99.95 percent.

27) Water removal, sampling and characterization activities shall observe the following limitations:

a) Total volume of samples from vessels shall not exceed 50 liters per year; sample volume shall be tracked in a log; specific approval for the format of this log shall be obtained from the WDOH prior to commencement of sampling activities.
b) Total surface area of sample coupons collected from vessels shall not exceed 0.2 m^2 per year; sample coupon surface area shall be tracked in a log; specific approval for the format of this log

shall be obtained from the WDOH prior to commencement of sampling activities.

c) Total volume of samples from pipes shall not exceed ten liters per year; sample volume shall be tracked in a log; specific approval for the format of this log shall be obtained from the WDOH prior to commencement of sampling activities.

d) Total length of pipe sections sampled shall not exceed ten meters per year; pipe section sample length shall be tracked in a log in an approved format; specific approval for the format of this log shall be obtained from the WDOH prior to commencement of sampling activities.

e) Removal of water from the pit and submerged tanks in C-Cell shall not exceed 200,000 liters. Volume of water removed shall be tracked in a log; specific approval for the format of this log shall be obtained from the WDOH prior to commencement of water removal activities.

28) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

29) Periodic confirmatory monitoring (PCM) for the potential emissions from the 291-T-1 stack shall consist of the current sample collection routine in use for the 291-T-1 emission unit as follows:

The record sampler for the 291-T- 1 stack shall be operated continuously, and particulate sample air filters shall be collected biweekly. The biweekly samples shall be analyzed for gross alpha/beta activity and composited quarterly for specific isotopic analysis (strontium-90, cesium-137, europium-154, plutonium-238, plutonium-239/240, and americium-241). Emissions from this activity shall be reported as part of the T-Plant stack emissions data.

30) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: ENTERING AND CHARACTERIZING OF THE 224-T FACILITY PROCESS CELLS

Date Approved: 25-Jul-02
Emission Unit Name: TYPE-1, TYPE-2, TYPE-3

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	Type-2 and Type-3
	Charcoal filter	1	Type-2 and Type-3
	HEPA	1	Type-1

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements. Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	GROSS ALPHA/BETA	Annual, unless sspecified by the NOC.

Sampling Requirements: One of the following methods may be chosen for actual emissions reporting: nondestructive assay, record sampler, or continuous air monitoring, whichever is more appropriate.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

09/18/2001 NOC Revision Form DOE/RL-2001-19, Revision 1B, approved September 18, 2001 to provide process description change.

05/10/2002 NOC Revision form, DOE/RL-2001-19, Rev. 1C, approved on May 10, 2002 to provide changes to sections 5 and 10. Approval letter, AIR 02-704, mailed on July 25, 2002.

06/11/2001 NOC DOE/RL-2001-19, Revision 0, approved on June 11, 2001 via AIR 01-602.

07/02/2001 NOC Revision form DOE/RL-2001-19, Revision 1A, approved July 2, 2001 to provide process and condition changes.

11/16/2001 Conditions and Limitations, AIR 01-1104, mailed on November 16, 2001 for revision forms approved July 2, 2001 and September 18, 2001.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 1.25E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 1.25E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

3) **This process is limited to:**
entering the 224-T Facility to determine the condition and contents of the facility's cells, tanks, and vessels.

A containment tent shall be erected outside each access door. The containment tent shall consist of two or more chambers, where the inner chamber shall surround the cell door and the outer chamber shall function as an airlock. Alpha and beta continuous air monitors (CAM) shall monitor each chamber and shall run continuously whenever the cell door is open. The inner chamber shall be fitted with a Type I portable temporary radioactive air emissions unit (PTRAEU) exhauster to provide air flow and contamination control in the containment tent. The exhauster shall be run intermittently to control radiological conditions, at the direction of the field work supervisor in collaboration with the health physics technician (HPT). The containment tent shall be isolated from the cell (door closed or otherwise blocked) before operating the exhauster. The Type I PTRAEU shall be used in accordance with the conditions, controls, monitoring requirements and limitations of the latest approved revision of the PTRAEU NOC (DOE/RL-96-75).

The following characterization activities are allowed in the cells and/or containment tent:

a. Establishing radiological conditions/map (i.e., dose rates, smearable and fixed contamination, and airborne concentrations);
b. Nondestructive data analyses (NDA) measurements of equipment;
c. Collection of liquid and solid samples from open vessels, trenches, or sumps;
d. Collection of ultrasonic data on vessels and piping;
e. Taking photographs;
f. Performing visual inspections;
g. Removing flanges to collect samples from inside equipment or piping;
h. Cutting or drilling into piping to collect samples with appropriate equipment such as a reciprocating saw, a circular saw, a hacksaw, a tri-tool, or an abrasive wheel;
i. Minor decontamination activities such as wiping down, applying fixatives or sealants, etc., performed in the cell or in the containment tent. Decontamination to reduce dose rates or remove contamination for personnel safety, to remove characterization equipment brought in, or to remove incidental loose equipment or waste found in the cell;
j. Size reduction and packaging and containerizing of incidental, loose equipment or waste found in the cell for removal and/or disposal;
k. Removal of infiltrated water from the pit and the submerged tanks in C-Cell by pumping into tanker trucks for subsequent disposal;
l. Characterization of the removed water prior to disposal;
m. Investigation of the source of water infiltrated into C-Cell; and

n. Sealing and grouting of leaks causing water infiltration.

A small amount of excavation is allowed to take place around the cell access doors to support installation of the containment tents. Manual digging methods with shovels, picks and rakes shall be used. Up to two cubic meters of contaminated soil may be disturbed.

Within the containment tent, the weather barrier cover over the cell access door shall be removed. The integrity and functionality of the cell door shall be determined and as a result the door may be removed and replaced with another door. Any other physical barrier that limits access to the cell also shall be removed.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Alpha 0	9.86E-02
Beta 0	5.11E+00

5) These Conditions and Limitations must be proceduralized prior to starting activities granted by this approval.

6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

9) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10).

10) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose

standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

17) **This condition was obsoleted on 11/9/2001.** When this project is complete, or operations cease, the facility must notify the department via a report of closure, including whether or not any potential for airborne releases occurred (WAC 246-247-080(6)).
Condition replaced by new standard condition

18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

21) The dose to the maximally exposed member of the public from unabated emissions associated with this NOC and exhausted by the PTREAU shall not exceed 1.12E-03 mrem/year. For the purposes of dose estimation, gross beta air concentrations associated with this emission point shall be conservatively assumed to consist entirely of Sr-90. Gross alpha air concentrations associated with this emission point shall be conservatively assumed to consist entirely of Pu-239.

22) If a Portable/Temporary Radioactive Air Emission Unit (PTRAEU) is used, the conditions, controls, monitoring requirements and limitations of the latest approved version of the PTRAEU Notice of Construction shall be required.

23) HPT coverage shall be provided during all cell entries and excavation activities.

24) Characterization activities shall be stopped if general surface contamination levels in the containment tent reach 40,000 dpm/100 cm^2 alpha or 2,000,000 dpm/100 cm^2 beta/gamma or if general air concentration levels in the containment tent reach 2.0 E-9 microcuries/milliliter alpha or 2.0 E-6 microcuries/milliliter beta/gamma. In this event the Department of Health shall be notified of existing conditions and work stoppage. Following such a work stoppage, activities in the process cells shall not continue until a review of the work and encountered conditions has been performed and a determination made, in concurrence with the Department of Health, that no threat to the environment exists, or proper controls have been put in place to mitigate any further threat.

25) When a HEPA Filtered Vacuum Radioactive Air Emission Unit (HEPA VAC) is used, the conditions, controls, monitoring requirements and limitations of the latest approved revision of the HEPA VAC Notice of Construction shall be required.

26) Periodic confirmatory measurements (PCM) for emissions from the containment tent shall be performed and shall consist of the radiological surveys and CAM readings/log papers from the containment tent. Compliance shall be demonstrated by showing that actual emissions are inherently

less than the estimated emissions, which are based and calculated from the same contamination levels.

If a PTRAEU or a HEPA filtered vacuum radioactive air emission unit is used, PCM for emissions from those units shall be performed as required by the respective NOCs.

27) All work covered by this NOC must be completed by December 31, 2005.

28) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6).

Approval Number: AIR 02-704 NOC ID: 500

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: ENTERING AND CHARACTERIZING OF THE 224-T FACILITY PROCESS CELLS

Date Approved: 25-Jul-02
Emission Unit Name: 200 AREA DIFFUSE/FUGITIVE

This is a MAJOR, FUGITIVE, non-point source emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT** ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential EDE.	As listed in the following Conditions and Limitations.

Sampling Requirements: Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

09/18/2001 NOC Revision Form DOE/RL-2001-19, Revision 1B, approved September 18, 2001 to provide process description change.

05/10/2002 NOC Revision form, DOE/RL-2001-19, Rev. 1C, approved on May 10, 2002 to provide changes to sections 5 and 10. Approval letter, AIR 02-704, mailed on July 25, 2002.

06/11/2001 NOC DOE/RL-2001-19, Revision 0, approved on June 11, 2001 via AIR 01-602.

07/02/2001 NOC Revision form DOE/RL-2001-19, Revision 1A, approved July 2, 2001 to provide process and condition changes.

11/16/2001 Conditions and Limitations, AIR 01-1104, mailed on November 16, 2001 for revision forms approved July 2, 2001 and September 18, 2001.

Printed on 25-Jul-02

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 1.25E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 1.25E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

3) **This process is limited to:**
entering the 224-T Facility to determine the condition and contents of the facility's cells, tanks, and vessels.

A containment tent shall be erected outside each access door. The containment tent shall consist of two or more chambers, where the inner chamber shall surround the cell door and the outer chamber shall function as an airlock. Alpha and beta continuous air monitors (CAM) shall monitor each chamber and shall run continuously whenever the cell door is open. The inner chamber shall be fitted with a Type I portable temporary radioactive air emissions unit (PTRAEU) exhauster to provide air flow and contamination control in the containment tent. The exhauster shall be run intermittently to control radiological conditions, at the direction of the field work supervisor in collaboration with the health physics technician (HPT). The containment tent shall be isolated from the cell (door closed or otherwise blocked) before operating the exhauster. The Type I PTRAEU shall be used in accordance with the conditions, controls, monitoring requirements and limitations of the latest approved revision of the PTRAEU NOC (DOE/RL-96-75).

The following characterization activities are allowed in the cells and/or containment tent:

a. Establishing radiological conditions/map (i.e., dose rates, smearable and fixed contamination, and airborne concentrations);
b. Nondestructive data analyses (NDA) measurements of equipment;
c. Collection of liquid and solid samples from open vessels, trenches, or sumps;
d. Collection of ultrasonic data on vessels and piping;
e. Taking photographs;
f. Performing visual inspections;
g. Removing flanges to collect samples from inside equipment or piping;
h. Cutting or drilling into piping to collect samples with appropriate equipment such as a reciprocating saw, a circular saw, a hacksaw, a tri-tool, or an abrasive wheel;
i. Minor decontamination activities such as wiping down, applying fixatives or sealants, etc., performed in the cell or in the containment tent. Decontamination to reduce dose rates or remove contamination for personnel safety, to remove characterization equipment brought in, or to remove incidental loose equipment or waste found in the cell;
j. Size reduction and packaging and containerizing of incidental, loose equipment or waste found in the cell for removal and/or disposal;
k. Removal of infiltrated water from the pit and the submerged tanks in C-Cell by pumping into tanker trucks for subsequent disposal;
l. Characterization of the removed water prior to disposal;
m. Investigation of the source of water infiltrated into C-Cell; and

n. Sealing and grouting of leaks causing water infiltration.

A small amount of excavation is allowed to take place around the cell access doors to support installation of the containment tents. Manual digging methods with shovels, picks and rakes shall be used. Up to two cubic meters of contaminated soil may be disturbed.

Within the containment tent, the weather barrier cover over the cell access door shall be removed. The integrity and functionality of the cell door shall be determined and as a result the door may be removed and replaced with another door. Any other physical barrier that limits access to the cell also shall be removed.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Alpha 0	1.78E-01
Beta 0	5.49E-02

5) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

6) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

7) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

8) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10).

9) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

10) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

11) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

12) **This condition was obsoleted on 11/9/2001.** When this project is complete, or operations cease, the facility must notify the department via a report of closure, including whether or not any potential for airborne releases occurred (WAC 246-247-080(6)).
Condition replaced by new standard condition

13) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

14) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event

the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

15) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

16) All work covered by this NOC must be completed by December 31, 2005.

17) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

18) The dose to the maximally exposed member of the public from unabated diffuse and fugitive emissions associated with excavation activities under this NOC shall not exceed 3.05E-03 mrem/year. For the purposes of dose estimation, gross beta air concentrations shall be conservatively assumed to consist entirely of Sr-90. Also for the purposes of dose estimation, gross alpha air concentrations associated with excavation under this NOC shall be conservatively assumed to consist entirely of Am-241.

19) These conditions and limitations must be proceduralized prior to starting activities granted by this approval.

20) If a Portable/Temporary Radioactive Air Emission Unit (PTRAEU) is used, the conditions, controls, monitoring requirements and limitations of the latest approved version of the PTRAEU Notice of Construction shall be required.

21) HPT coverage shall be provided during all cell entries and excavation activities.

22) Appropriate excavation controls such as water, fixatives, covers, or windscreens shall be applied, if needed, as determined by the contractor's Health Physics organization. Spoil piles containing contaminated soil shall be segregated from the clean soil. Containerizing soil for disposal may also be performed.

23) After backfilling, the soil surface radiological contamination levels shall be verified to be less than 5,000 dpm/100 cm^2 beta/gamma and less than 100 dpm/100 cm^2 alpha. If contamination is present above these levels, the contaminated soil shall be removed and containerized for disposal or covered or fixed to provide containment of the contamination.

24) When a HEPA Filtered Vacuum Radioactive Air Emission Unit (HEPA VAC) is used, the conditions, controls, monitoring requirements and limitations of the latest approved revision of the HEPA VAC Notice of Construction shall be required.

25) Total volume of contaminated soil disturbed in excavation for installation of containment tents shall not exceed two cubic meters.

26) Periodic confirmatory measurements (PCM) for the diffuse and fugitive emissions shall be performed and shall consist of the radiological surveys from the soil excavation activities. Compliance shall be demonstrated by showing that actual emissions are inherently less than the estimated emissions, which are based and calculated from the same contamination levels.

If a PTRAEU or a HEPA filtered vacuum radioactive air emission unit is used, PCM for emissions from those units shall be performed as required by the respective NOCs.

27) In addition to PCM, diffuse/fugitive emissions shall be monitored using the 200 West Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change which moves, adds, or deletes monitoring stations in this near-field ambient monitoring program must be approved by the department.

28) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

29) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting, requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)).

Approval Number: AIR 03-106 NOC ID: 502

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: 324 BUILDING CLEANOUT AND DEACTIVATION ACTIVITIES

Date Approved: 30-Dec-02

Emission Unit Name: EP-324-01-S **Emission Unit ID** 360

This is a MAJOR, ACTIVELY ventilated emission unit

This emission unit requires the following Abatement Technology:

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
Zone 2	HEPA	1	Stage is control for Zone 2
Zone 2	Prefilter	1	
Zone 2	Fan	1	2 in parallel. Serves both Storage Vault/Rms & Zone 2
B Cell	Electro Static Precipitator	1	
B Cell	Prefilter	2	
Zone 1 Cells	Fan	1	3 in parallel, Serves B Cell, Zone 1 Cells.
Zone 1 Cells	HEPA	1	Last stage shared with B Cell
Zone 1 Cells	Prefilter	2	1 for Zone 1 cell, 1 for POG V/V

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93(b)(4) & WAC 246-247-75(2)	Method 2 appendix A Method 114 appendix B 61.93(b)(2)(ii) ANSI N13.1	All radionuclides which could contribute 10% of the potential EDE.	Continuous

Sampling Requirements: Continuous

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

06/27/2001 Original NOC, DOE/RL-2000-05 Deactivation Activities at the 324 Building, submitted March 14, 2001. Approved on June 27, 2001 via AIR 01-608 (NOC ID 469).

12/31/2001 NOC, Deactivation Activities at the 324 Building (DOE/RL-2000-05 revision 1), received December 31, 2001. This NOC revision incorporates two previous NOC approvals: AIR 01-608 (NOC 469, Deactivation Activities at the 324 Building) and AIR 95-903 (NOC 113, Cleanout of B-Cell in the 324 Building). Approved via AIR 02-210 on February 25, 2002.

08/21/2002 AOP Minor Modification, 02-RCA-0453, received July 15, 2002 to state that AIR 02-210 replaced all previous conditions. No new Conditions and Limitations mailed. Revised AOP Minor Modification, 02-RCA-0453 revised, received August 21, 2002

Printed on 24-Jan-03

with no new Conditions and Limitations mailed.

12/30/2002 Revison form received December 18, 2002 approved via AIR 03-106 dated January 10, 2003 with new Conditions/Limitations. This will be included as a minor modification to the AOP.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 4.20E-01 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 8.20E+02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

activities that will result in placing the entire building in a stabilized and secure configuration for long-term surveillance and maintenance and/or decommissioning and demolition. Stabilization involves solid waste removal and activities using various decontamination methods on radiologically contaminated areas within the 324 Building.

The 324 Building areas that will undergo deactivation include the following:

- REC activities
  - -A-Cell
  - -B-Cell
  - -C-Cell
  - -D-Cell
  - -Airlock.
- B-Cell sample room
- High-level vault (HLV) and tanks
- Low-level vault (LLV) and tanks
- REC pipe trenches
- Cask handling area (CHA)
- Truck lock and loadout station
- Laboratories/rooms and associated piping/utilities
- Shielded Materials Facility (SMF)
  - East cell
  - South cell
  - Airlock cell
- Engineering Development Laboratory (EDL) Room 101
- EDL-102
- EDL-145
- EDL-146
- EDL-147
- High Bay Engineering Laboratory (HBEL)
- Tank pit (in basement)
- Wastewater diverter tank.

Large items (equipment and waste materials) will be size-reduced and packaged for transport to

compliant storage/disposal facilities as appropriate. The remaining loose material will be collected and packaged for storage/disposal. Various decontamination methods will be employed to reduce/remove contamination. As the decontamination work is completed, the associated ventilation ductwork will be remediated (decontamination, isolation, or removal). Once decontamination has been achieved to acceptable levels for the areas served by the high-efficiency particulate air (HEPA) filters and similar particulate emission control devices, those control devices will be removed and/or isolated. The ventilation system for the 324 Building stack (EP-324-01-S) will operate at a reduced flow, shutting down in stages over an extended period, culminating in eventual closure of the stack.

The chemical and physical processes associated with decontamination of the 324 Building and associated ancillary facilities will consist of the following:

- Large equipment will be size-reduced, as needed, using processes such as mechanical shearing, cutting torches, laser cutters, and/or physical sawing activities.

- Size-reduced items and loose material will be collected and packaged to meet acceptance criteria for transfer to other suitable storage and disposal facilities.

- Cleaning/collection processes might include various methods or combinations of mechanical cleaning methods, e.g., blast nozzle cleaning; ultra high-pressure water scarification; media blast cleaning (with either vacuum recovered recycled or one shot media, where blast air, media, and radiologically contaminated material are vacuum recovered to prevent dispersion); scabbling (aggressive surface removal of metal and concrete); grinding; and vacuuming.

- Liquid decontamination could be employed to reduce contamination levels. This process would consist of spraying radiologically contaminated surfaces with pressurized liquids and collecting the resultant solutions.

- Processing of decontamination solutions will be accomplished predominantly by evaporation (using evaporators and dryers, packaging the solids, adding stabilizers as needed to form a solid mass), with direct release of the water vapor to the REC ventilation system. The release of water vapor will be controlled to protect the HEPA filter media by maintaining relative humidity and temperature conditions such that the system will not experience moisture collection on the filters. Relative humidity and temperature conditions will be controlled by heating the air passing through the REC, by limiting the boil off rate, by controlling wattage applied to the evaporator heater unit(s), and/or by distributing the moisture to a larger airflow. Similar methods could be employed for the SMF.

- Spent decontamination solutions that are not evaporated will be staged in suitably designed tanks, if staging is needed. Treated liquids (filters, ion exchange, etc.) might be staged in suitably designed and located tanks and transferred to other facilities on the Hanford Site by tanker truck through the loadout stall (LOS). Smaller volumes might be containerized (e.g., packaged in absorbents in drums or placed in drums or carboys). If tanker trucks are used, displaced air from the tanker trucks would be routed back to the LOS.

- After deactivation efforts have been completed for a particular area of the 324 Building, ventilation ductwork for that area will be decontaminated, removed, and/or isolated. After

sufficient decontamination has been achieved upstream of the associated HEPA filter or emissions/abatement control devices, the control devices will be removed or isolated.

- Containment and portable exhausters will be used as needed for personnel protection in local ventilated spaces for shutting down the existing ventilation system and for ventilating radiologically contaminated areas (piping, ancillary buildings, etc.) outside of areas that are served by the ventilation system for the 324 Building stack (EP-324-01-S).

Annual maintenance inspections of the 324 Building wastewater diverter tank and final disposition of rainwater infiltration (such as by using a tanker truck or pumping into drums) may be performed without use of containment or portable exhausters.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Am - 241	2.30E+04	Co - 60	2.80E+05	Cs - 137	5.90E+05
Sr - 90	3.00E+05				

5) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060(2)(d)).

6) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

7) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).

8) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

9) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

10) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

11) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

12) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

13) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

14) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

15) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose

standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

16) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

17) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

19) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

    Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

    All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

20) During operation of evaporation equipment, relative humidity and temperature of Zone 1 air will be monitored to ensure conditions are maintained to protect all Zone 1 HEPA filters from experiencing moisture collection. If relative humidity and temperature conditions are not maintained and can not be restored/adjusted within four hours, notification will be made to the Department within 24 hours.

21) Maintain the temperature of the exhaust air stream below 250 degrees Fahrenheit prior to HEPA filtration.

22) When a tanker truck is used to load out spent decontamination solutions, displaced air from the tanker shall be routed into the load out stall and vent through the Zone 1 exhaust system.

23) After decontamination work is completed in a given area, the duct work for that area must be decontaminated, removed or isolated. After sufficient decontamination work has been done upstream of the associated HEPA filters or control devices, the control devices may be removed or isolated

following approval by the Department.

24) During operation of evaporation equipment, relative humidity and temperature of Zone I air will be controlled using the following methods to ensure conditions are maintained to protect all Zone I HEPA filters from experiencing moisture collection:
   a. Heating the air as it passes through the Zone I and/or Zone II spaces.
   b. Limiting the boil-off rate to less than 15 gallons per hour.
   c. Controlling wattage applied to the evaporator heater unit(s), and/or
   d. Distributing the moisture to a larger airflow.

25) The facility must notify the department to downgrade the EP-324-01-S to a minor stack and obsolete any approval conditions, as appropriate.

26) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).

27) The emission unit monitoring system shall have the following activities performed:

Within two years of this approval:

a. A visual check of nozzle position and orientation as well as measurements of nozzle openings;
b. Checks to ensure the tightness of all fittings and connections as well as a leak test of the entire sampling system; and
c. Visual inspections for corrosion, physical damage, or dust loading of the probe, sample lines, and monitoring system equipment.

Annually starting within one year of this approval:

d. A functional/calibration check of monitoring system instrumentation shall be performed;
e. The USDOE shall provide to WDOH for review copies of the procedures used to perform the above activities.

28) Before final removal of the in-cell filters and electrostatic precipitators (ESPs) located in B-Cell, WDOH will be notified.

29) The APQ for Am-241shall conservatively represent all alpha emitting isotopes.

30) The APQs for Cs-137, Sr-90, and Co-60 shall conservatively represent all beta/gamma emitting isotopes.

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: 324 BUILDING CLEANOUT AND DEACTIVATION ACTIVITIES

Date Approved: 30-Dec-02

Emission Unit Name: 300 AREA DIFFUSE/FUGITIVE **Emission Unit ID 443**

his is a MINOR, FUGITIVE, non-point source emission unit.

his emission unit requires the following Abatement Technology:

pplicable Requirements: **ALARACT**

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential EDE.	As listed in the following Conditions and Limitations.

Sampling Requirements: Existing near-facility monitoring stations.

dditional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

06/27/2001 Original NOC, DOE/RL-2000-05 Deactivation Activities at the 324 Building, submitted March 14, 2001. Approved on June 27, 2001 via AIR 01-608 (NOC ID 469).

12/31/2001 NOC, Deactivation Activities at the 324 Building (DOE/RL-2000-05 revision 1), received December 31, 2001. This NOC revision incorporates two previous NOC approvals: AIR 01-608 (NOC 469, Deactivation Activities at the 324 Building) and AIR 95-903 (NOC 113, Cleanout of B-Cell in the 324 Building). Approved via AIR 02-210 on February 25, 2002.

08/21/2002 AOP Minor Modification, 02-RCA-0453, received July 15, 2002 to state that AIR 02-210 replaced all previous conditions. No new Conditions and Limitations mailed. Revised AOP Minor Modification, 02-RCA-0453 revised, received August 21, 2002 with no new Conditions and Limitations mailed.

12/30/2002 Revison form received December 18, 2002 approved via AIR 03-106 dated January 10, 2003 with new Conditions/Limitations. This will be included as a minor modification to the AOP.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 4.20E-01 mrem/year to the

Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 8.20E+02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

activities that will result in placing the entire building in a stabilized and secure configuration for long-term surveillance and maintenance and/or decommissioning and demolition. Stabilization involves solid waste removal and activities using various decontamination methods on radiologically contaminated areas within the 324 Building.

The 324 Building areas that will undergo deactivation include the following:

- REC activities
  -A-Cell
  -B-Cell
  -C-Cell
  -D-Cell
  -Airlock.
- B-Cell sample room
- High-level vault (HLV) and tanks
- Low-level vault (LLV) and tanks
  REC pipe trenches
- Cask handling area (CHA)
- Truck lock and loadout station
- Laboratories/rooms and associated piping/utilities
- Shielded Materials Facility (SMF)
  - East cell
  - South cell
  - Airlock cell
- Engineering Development Laboratory (EDL) Room 101
-EDL-102
- EDL-145
- EDL-146
- EDL-147
- High Bay Engineering Laboratory (HBEL)
- Tank pit (in basement)
- Wastewater diverter tank.

Large items (equipment and waste materials) will be size-reduced and packaged for transport to compliant storage/disposal facilities as appropriate. The remaining loose material will be collected and packaged for storage/disposal. Various decontamination methods will be employed to reduce/remove contamination. As the decontamination work is completed, the associated ventilation ductwork will be remediated (decontamination, isolation, or removal). Once decontamination has been achieved to acceptable levels for the areas served by the high-efficiency particulate air (HEPA) filters and similar particulate emission control devices, those control devices will be removed and/or isolated. The ventilation system for the 324 Building stack (EP-324-01-S) will operate at a reduced flow, shutting down in stages over an extended period, culminating in eventual closure of the stack.

The chemical and physical processes associated with decontamination of the 324 Building and associated ancillary facilities will consist of the following:

- Large equipment will be size-reduced, as needed, using processes such as mechanical shearing, cutting torches, laser cutters, and/or physical sawing activities.

- Size-reduced items and loose material will be collected and packaged to meet acceptance criteria for transfer to other suitable storage and disposal facilities.

- Cleaning/collection processes might include various methods or combinations of mechanical cleaning methods, e.g., blast nozzle cleaning; ultra high-pressure water scarification; media blast cleaning (with either vacuum recovered recycled or one shot media, where blast air, media, and radiologically contaminated material are vacuum recovered to prevent dispersion); scabbling (aggressive surface removal of metal and concrete); grinding; and vacuuming.

- Liquid decontamination could be employed to reduce contamination levels. This process would consist of spraying radiologically contaminated surfaces with pressurized liquids and collecting the resultant solutions.

- Processing of decontamination solutions will be accomplished predominantly by evaporation (using evaporators and dryers, packaging the solids, adding stabilizers as needed to form a solid mass), with direct release of the water vapor to the REC ventilation system. The release of water vapor will be controlled to protect the HEPA filter media by maintaining relative humidity and temperature conditions such that the system will not experience moisture collection on the filters. Relative humidity and temperature conditions will be controlled by heating the air passing through the REC, by limiting the boil off rate, by controlling wattage applied to the evaporator heater unit(s), and/or by distributing the moisture to a larger airflow. Similar methods could be employed for the SMF.

- Spent decontamination solutions that are not evaporated will be staged in suitably designed tanks, if staging is needed. Treated liquids (filters, ion exchange, etc.) might be staged in suitably designed and located tanks and transferred to other facilities on the Hanford Site by tanker truck through the loadout stall (LOS). Smaller volumes might be containerized (e.g., packaged in absorbents in drums or placed in drums or carboys). If tanker trucks are used, displaced air from the tanker trucks would be routed back to the LOS.

- After deactivation efforts have been completed for a particular area of the 324 Building, ventilation ductwork for that area will be decontaminated, removed, and/or isolated. After sufficient decontamination has been achieved upstream of the associated HEPA filter or emissions/abatement control devices, the control devices will be removed or isolated.

- Containment and portable exhausters will be used as needed for personnel protection in local ventilated spaces for shutting down the existing ventilation system and for ventilating radiologically contaminated areas (piping, ancillary buildings, etc.) outside of areas that are served by the ventilation system for the 324 Building stack (EP-324-01-S).

Annual maintenance inspections of the 324 Building wastewater diverter tank and final disposition of

rainwater infiltration (such as by using a tanker truck or pumping into drums) may be performed without use of containment or portable exhausters

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Alpha - 0	3.60E-01	B/G - 0	1.13E+02

5) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

6) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

7) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).

8) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

9) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

10) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

11) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

12) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

13) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

14) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

15) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

16) **This condition was obsoleted on 2/25/2002.** When this project is complete, or operations cease, the facility must notify the department via a report of closure, including whether or not any potential for airborne releases occurred (WAC 246-247-080(6)).
Conditions/Limitations added via AIR 02-210 on February 25, 2002.

17) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the

appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

18) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

19) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

20) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

    Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

    All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

21) Diffuse/Fugitive emissions shall be monitored using the 300 Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change to this near-field ambient monitoring program must be approved by the department.

22) For areas being deactivated outside of areas served by the EP-324-01-S ventilation system, containment and portable exhausters shall be used as needed for protection of human health or the environment, consistent with Department requirements.

23) When a Portable/Temporary Radioactive Air Emission Unit (PTRAEU) is used during 324 Deactivation activities, the conditions, controls, monitoring requirements and limitations of the PTRAEU NOC, latest approved version, shall be required.

24) When a HEPA Filtered Vacuum Radioactive Air Emission Unit (HEPA VAC) is used during tie-in activities (e.g., utilities or piping), the conditions, controls, monitoring requirements and limitations of the HEPA VAC NOC, latest approved version, shall be required.

25) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).

26) Total emissions from the 300 Area Diffuse/Fugitive for this activity shall not exceed 1.0e-8 mrem/year

Approval Number: AIR 02-509 NOC ID: 504

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: EXHAUST FAN REPLACEMENT AT THE 291-T-1 STACK

Date Approved: 22-May-02
Emission Unit Name: 200 AREA DIFFUSE/FUGITIVE

This is a MAJOR, FUGITIVE, non-point source emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential EDE..	As listed in the following Conditions and Limitations.

Sampling Requirements: Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

01/25/2002 NOC, Exhaust Fan Replacement at the 291-T-1 Stack (DOE/RL-2002-03, Revision 0), received January 25, 2002. Incomplete information required a new revision to the NOC.

04/02/2002 NOC revision, Exhaust Fan Replacement at the 291-T-1 Stack (DOE/RL-2002-03, Revision 1), received April 9, 2002 and approved on May 22, 2002 via AIR 02-509.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 6.50E-04 mrem/year to the Maximally Exposed Individual. The total unabated emission limit for this Notice of Construction is limited to 6.50E-04 mrem/year to the Maximally Exposed Individual.

Printed on 22-May-02

3) **This process is limited to:**
the following activities associated with the exhaust fan replacement:

- The existing exhaust fans #1 and #2 will be de-energized. The entire 291-T-1 Stack ventilation system will be shut down for as long as necessary, and plant operations will be halted. Existing procedures pertaining to a ventilation outage will be followed to monitor and control passive or fugitive emissions. The existing exhaust fans #1 and #2 will be isolated from the 291-T-1 Stack by installation of new blanks both upstream and downstream of each fan. The blanks will be installed by cutting into existing ductwork. After installation of the blanks, stack flow will be restored using exhaust fan #3, and plant operations will resume.

- As funding becomes available, the existing exhaust fans #1 and #2 and associated ductwork and components will be disassembled by mechanical means (e.g., unbolting and/or sawing), removed, appropriately packaged, and disposed. Disposition of exhaust fan #1 will be completed either under this NOC or with a subsequent as low as reasonably achievable control technology (ALARACT) demonstration.

- A new exhaust fan #4 will be placed on an existing concrete pad, and associated ductwork will be attached. The entire 291-T-1 Stack ventilation system will be shut down (and plant operations halted) for utility hookup and final tie-in of the new exhaust fan #4 into the 291-T-1 Stack ventilation system. The new exhaust fan #4 will be tested for operability. Existing procedures pertaining to a ventilation outage will be followed to monitor and control passive or fugitive emissions. The existing duct that connects to the inlet of existing fan #2 will be extended to the inlet of the new exhaust fan #4. The outlet of the new exhaust fan #4 will be connected at the discharge point of exhaust fan #1 located near the stack. After installation of exhaust fan #4, stack flow will be restored and plant operations will resume. Final testing of exhaust fan #4 will follow.

- For process control, a volumetric airflow monitor may be installed on the existing exhaust fan #3 and new exhaust fan #4 to measure the air flow. The existing exhaust fan #3 and new exhaust fan #4 each may be provided with a manual variable frequency drive to facilitate volumetric airflow control.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Alpha 0	1.00E-01
B/G 0	3.00E-01

5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060-(5)).

6) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

8) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

9) The department retains the right to conduct stack sampling, environmental monitoring or other testing

around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).

10) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

11) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

12) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

14) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

15) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

17) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

    Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity.

    All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced

inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

20) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

21) The following is a list of the approved emission controls used during the replacement activities:

a. The 291-T-1 filters, upstream of exhaust fan replacement activities, will remain in place.

b. Daily surveys for radiological contamination will be made at the 221-T Canyon points of egress (e.g., doors) during shutdown periods. Washington State Department of Health (WDOH) will be given a notification if any contamination is found as a result of these surveys.

c. WDOH will be provided with drawings or other documentation that demonstrate that existing isolation control dampers are designed to close when the ventilation is shutdown.

d. Diffuse/fugitive emissions will be monitored using the 200 Areas near-field ambient air monitors. Sample collection and analysis will follow that of the near-field monitoring program. Analytical results will be reported in the annual air emissions report.

e. Biweekly results from environmental field samplers near T-Plant Complex will be trended during periods of shutdown, and the trended results provided to WDOH after fan installation/operational verification is complete.

f. Health physics technician (HPT) coverage will be provided during all replacement activities.

g. Appropriate controls such as fixatives, covers, containment tents, or windscreens will be applied if needed as determined by the Health Physics organization.

Approval Number: AIR 03-107 NOC ID: 505

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: DEACTIVATION OF THE 327 BUILDING

Date Approved: 10-Jan-03

Emission Unit Name: EP-327-01-S **Emission Unit ID** 407

This is a MAJOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: ALARACT

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
Rm. 15 Hood and Cells	HEPA	1	
Rm. 15 Hood and Cells	Prefilter	1	Cells only
Rm. 15 Hood and Cells	Fan	1	2 in parallel, one standby. Serves Rm. 15 and Cells
Remaining areas of Building 327	HEPA	1	Single stage
Remaining areas of Building 327	Fan	1	2 in parallel (machine shop is power ventilated with a single fan to the main flowpath of the remaining areas of building 327.)

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93(b)(4) & WAC 246-247-75(2)	Method 2 appendix A Method 114 appendix B 61.93(b)(2)(ii) ANSI N13.1	All radionuclides which could contribute 10% of the potential EDE.	Continuous

Sampling Requirements: Continuous

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

02/13/2002 NOC. DOE/RL-2002-08 Revision 0, received February 13, 2002. NOC rewrite, DOE/RL-2002-08 Revision 1, received August 15, 2002. Conditions and Limitations, AIR 02-1013 mailed on October 24, 2002.

12/31/2002 Revision form received December 18, 2002 approved via AIR 03-107 dated January 10, 2003 with new Conditions/Limitations. This will be included as a minor modification to the AOP.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

Printed on 10-Jan-03

2) The total abated emission limit for this Notice of Construction is limited to 1.20E-01 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 2.50E+02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

The deactivation of the 327 Building.

General Deactivation Activities

The general chemical and physical processes associated with deactivation of the 327 Building and associated ancillary facilities shall consist of the following:

Large equipment shall be removed and/or size-reduced, as needed, using processes such as mechanical shearing, cutting torches, laser cutters, and/or physical sawing activities.

Size-reduced items and loose material shall be collected and packaged to meet waste acceptance criteria for transfer to suitable storage and disposal facilities.

Cleaning/collection processes are limited to the following various methods or combinations of mechanical cleaning methods, e.g., blast nozzle cleaning, ultra high-pressure water scarification, media blast cleaning (with either vacuum recovered recycled or one shot media, where blast air, media, and radiologically contaminated material are vacuum recovered to prevent dispersion); scabbling (aggressive surface removal of metal and concrete); grinding, and vacuuming.

Liquid decontamination can be employed to reduce contamination levels. This process shall consist of spraying radiologically contaminated surfaces with pressurized liquids and collecting the resultant solutions.

In the final stages of deactivation, after removal of materials in storage in the 327 Building basin, the basin water shall be removed. Appropriate basin surface decontamination/ stabilization shall be conducted.

Spent decontamination solutions and basin water shall be staged in suitably designed tanks, if staging is needed. Treated liquids (filters, ion exchange, basin water, etc.) can be staged in suitably designed and located tanks and transferred to other facilities on the Hanford Site by tanker truck. Smaller volumes might be containerized (e.g., packaged in absorbents in drums or placed in drums or carboys). If tanker trucks are used, displaced air from the tanker trucks shall be routed back to the Zone I or Zone II exhaust systems.

After deactivation efforts have been completed for a particular area of the 327 Building, ventilation ductwork for that area shall be decontaminated, removed, and/or isolated. After sufficient decontamination has been achieved upstream of the associated HEPA filter or control devices, the control devices shall be removed or isolated.

Containment and portable exhausters shall be used as needed for personnel protection in local ventilated

spaces for shutting down the existing ventilation system and for ventilating radiologically contaminated areas (piping, ancillary buildings, etc.) outside of areas that are served by the existing 327 Building ventilation system.

Annual maintenance inspections of the 327 Building shall be performed without use of containment or portable exhausters.

Science and Technology Activities

The 327 Building has been proposed as the host for several hot demonstrations and deployments involving remote characterization, dry decontamination, and handling and size reduction beginning in fiscal year 2002 as part of this effort. The following provides examples of potential areas for science and technology development:

One project involves the demonstration and deployment of remote (in-cell) characterization and dry decontamination. This task shall support several onsite needs including monolithic disposal of the large, cast iron hot cells as non-transuranic (TRU) waste. Another project will involve the remote-handled TRU (RH-TRU) removal and size reduction of a highly contaminated ion exchange column that presently is stored in a water basin in the 327 Building and decontamination of the pool cell. Opportunities exist to expand this effort to include demonstration of removal of contaminated subsystems, such as the pool cell, heating, ventilation, and air conditioning ducting, and the nitrogen recirculation system.

The primary baseline approach for deactivation of the 327 Building hot cells is decontamination using various physical and mechanical means, with some liquid decontamination employed where determined to be appropriate. Based on ALARA, cost, schedule, and regulatory perspectives, it can be advantageous to avoid liquid decontamination (and resultant waste handling) and remove the cells from the building for disposal, with minimal or no decontamination. Hence, the proposed physical/chemical processes include cell removal.

The contaminated ion exchange column shall be removed and size reduced as part of deactivation. The ion exchange column is located under water in the large storage basin, which is 3.0 m (10 ft) wide by 4.6 m (15 ft) long by 5.2 m (17 ft) deep. The column contains an unknown ion exchange media that, based on recent surveys and estimates, contains ~120 curies of cesium.

The 327 Building hot cells duct work and HEPA filters have inventories that are variable depending on what type of development work was performed in the associated hot cell. Large sources of semi-mobile material cannot be left in the building following closure or transition. Hence, the proposed physical/chemical processes shall include removal/disposition of some HVAC system radiological contamination.

The specific need is for the decontamination of highly contaminated (wet) storage basins in the 327 Building. The aforementioned large basin and a small basin [1.8 m (6 ft) by 2.4 m (8 ft) by 3.1 m 10 ft)] are connected by a 0.5 m (1.6 ft) wide by 3.1 m (10 ft) deep canal. The small water basin interfaces with hot cell number "A" to provide the capability for transfer of irradiated material from water storage to hot cell "A." The basins are coated concrete. The storage basins are contaminated with cesium, strontium, uranium, and transuranic components. There is a concentration of contaminants in a 'bathtub ring' located near the surface of the water. In addition to the 'bathtub ring', radioactive contamination has

penetrated to varying depths into the concrete wall and floor surfaces. Current decontamination technology consists of physical removal of the concrete surface (i.e., scabbling, sand blasting, etc.). None of these have been demonstrated underwater. Some contaminated concrete surfaces also have been painted and/or coated with a fixative. Project requirements might include removal of such coatings before decontamination of the concrete.

The Special Environment Radiometallurgy Facility (SERF) nitrogen recirculation system is located in the 327 Building. This system was used in the past to filter and cool the nitrogen atmosphere that was maintained in the SERF cell. The SERF cell was used for cutting and examination of irradiated fuel. Inventory and dose data are not complete, but gram quantities of plutonium are present. This system is approximately 2.4 m (8 ft) by 2.4 m (8 ft) by 4.6 m (15 ft) and consists of stainless steel ductwork of various sizes (mainly 6 and 8 inch diameter), two in-line fans, two filtration enclosures, two cooling coils, and two externally mounted compressor/condenser units. The proposed methods of deactivation, removal, and disposal of the SERF cell nitrogen recirculation system shall include those activities as previously described in the process description section titled "General Deactivation Activities".

Excavation:

Excavation shall take place in the vicinity of the 327 Building to support site stabilization and removing/isolating/blanking utilities. Access to underground piping and cable can be gained by use of an excavator. Manual digging methods with shovels, picks, and rakes also could be used. Up to approximately 5 m3 (160 ft3) of soil could be disturbed per activity. Contaminated soil removed during excavation activities shall be covered until replaced into the hole or otherwise dispositioned.

If needed or chosen for use during these activities, the sitewide guzzler, a portable temporary radioactive air emissions unit (PTRAEU) exhauster, or HEPA filtered vacuum radioactive air emission unit shall be used in accordance with the latest revisions of the NOCs ["Categorical Notice of Construction for use of the Guzzler Vacuum Excavation System for Radiologically Limited Activities on the Hanford Site" (approved by WDOH on December 18, 1998) or guzzler NOC', DOE/RL-96-75 and DOE/RL-97-50 respectively].

Excavation activities shall be monitored and evaluated as described below:

Many of the emission controls used during the excavation activities will be administrative, based on ALARA principles and consist of ALARA techniques. It is proposed that these controls be approved as low as reasonably achievable control technology (ALARACT) for excavation in the vicinity of the 327 Building.

1. Health physics technician (HPT) coverage will be provided during all demolition and excavation activities.

2. Appropriate controls such as water, fixatives, covers, containment tents, or windscreens shall be applied, if needed, as determined by the Health Physics organization. Contaminated soil removed during excavation activities shall be covered until replaced into the hole or otherwise dispositioned.

3. After leveling, the soil surface radiological contamination levels shall be verified less than 5,000 disintegrations per minute (dpm)/100 square centimeters (cm2) beta/gamma and less than 100 dpm/100 cm2 alpha. If contamination is present above these levels, soil shall be removed and containerized for

disposal or covered or fixed to provide containment of the contamination.

4. If a guzzler, PTRAEU, or HEPA filtered vacuum radioactive air emission unit is used, controls as described in the guzzler NOC, DOE/RL-96-75 or DOE/RL-97-50 shall be followed.

5. If field surveys during excavation identify localized areas of contamination greater than the gross levels described below (i.e., 500,000 dpm/100 cm2 beta/gamma and 3,000 dpm/100 cm2 alpha), additional surveys shall be conducted on the perimeter of the 'hot spot' to verify the localized nature, ensuring that the overall assumed contamination level is not exceeded.

Although no radiological contamination is anticipated, for conservatism it is assumed that the soil surface of a 10 meter perimeter surrounding the 327 Building footprint is contaminated (equating to approximately 2,400 square meters [2.4 x 107 square centimeters]) and that the gross contamination level for beta/gamma (as strontium-90) is limited to 500,000 dpm (per square centimeter).

* (2.4 x 107 cm2 of soil) x (500,000 dpm/cm2) = 1.2 x 1013 dpm

* For cesium-137: 1.9 x 1014 dpm per gram and 86.5 curies per gram

* For strontium-90: 3.1 x 1014 dpm per gram and 139 curies per gram

* At a 2:1 ratio of cesium-137 to strontium-90, 1.2 x 1013 dpm:

(0.67) [(1.2 x 1013)/1.9 x 1014)] 87 = 3.7 curies of cesium-137
(0.33) [(1.2 x 1013)/3.1 x 1014)] 139 = 1.8 curies of strontium-90.

It is recognized that because of historical activities in the 300 Area, isotopes of uranium might be encountered during excavation and decontamination activities. For conservatism, it is assumed that the 10 meter perimeter surrounding the 327 Building footprint is contaminated, and that the gross contamination level is the limit identified on the previous page for alpha [as uranium-234 (consistent with calculations bases in the guzzler NOC)] of 3,000 dpm.

* (2.4 x 107 cm2 of soil) x (3,000 dpm/cm2) = 7.2 x 1010 dpm
* For uranium-234: 1.4 x 1010 dpm per gram and 6.3 x 10-3 curies per gram
* 7.2 x 1010 dpm represents 5.1 grams of uranium-234 = 3.2 x 10-2 curies of uranium-234.

The sitewide guzzler could be used when evidence of low levels of soil contamination is provided. Backfill shall be made with the original material removed or brought in 'clean' soil.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Am - 241	3.25E+02	Co - 60	6.80E+02	Cs - 137	3.50E+02
Sr - 90	1.74E+02				

5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).

6) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable

standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

7) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

8) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

9) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

10) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10).

11) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

12) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

13) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

14) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

15) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

16) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

17) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060(2)(d)).

18) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

19) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for

inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

20) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

21) The emission unit monitoring system shall have the following activities performed:

Within two years of this approval:

a. A visual check of nozzle position and orientation as well as measurements of nozzle openings;
b. Checks to ensure the tightness of all fittings and connections as well as a leak test of the entire sampling system; and
c. Visual inspections for corrosion, physical damage, or dust loading of the probe, sample lines, and monitoring system equipment.

Annually starting within one year of this approval:

d. A functional/calibration check of monitoring system instrumentation shall be performed;
e. The USDOE shall provide to WDOH for review copies of the procedures used to perform the above activities.

22) The facility must notify the department to downgrade the EP-327-01-S to a minor stack and obsolete any approval conditions, as appropriate.

23) When a tanker truck is used to load out spent decontamination solutions, displaced air from the tanker trucks would be routed back to the Zone I or Zone II exhaust systems.

24) After decontamination work is completed in a given area, the duct work for that area must be decontaminated, removed or isolated. After sufficient decontamination work has been done upstream of the associated HEPA filters or control devices, the control devices may be removed or isolated following approval by the department.

25) The APQ for Am-241 conservatively represents all alpha emitting isotopes.

26) The APQs for Cs-137, Sr-90, and Co-60 shall conservatively represent all beta/gamma emitting isotopes.

27) Total emissions from the EP-327-01-S shall not exceed 2.5e+2 mrem/yr unabated and 8.6 E-2 mrem/year abated.

Approval Number: AIR 03-107 NOC ID: 505

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: DEACTIVATION OF THE 327 BUILDING

Date Approved: 10-Jan-03

Emission Unit Name: EP-327-02-V **Emission Unit ID** 408

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **ALARACT** ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	
	Fan	1	
	Prefilter	1	Serves compactor area.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93(b)(4)(i) & WAC 246-247-075(3)	Appendix B, Method 114(3)	TOTAL ALPHA TOTAL BETA	One 4-week sample per year
Sampling Requirements:	Record Sampling		

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

02/13/2002 NOC, DOE/RL-2002-08 Revision 0, received February 13, 2002. NOC rewrite, DOE/RL-2002-08 Revision 1, received August 15, 2002. Conditions and Limitations, AIR 02-1013 mailed on October 24, 2002.

12/31/2002 Revision form received December 18, 2002 approved via AIR 03-107 dated January 10, 2003 with new Conditions/Limitations. This will be included as a minor modification to the AOP.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 1.20E-01 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 2.50E+02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

Printed on 10-Jan-03

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**
The deactivation of the 327 Building.

General Deactivation Activities

The general chemical and physical processes associated with deactivation of the 327 Building and associated ancillary facilities shall consist of the following:

Large equipment shall be removed and/or size-reduced, as needed, using processes such as mechanical shearing, cutting torches, laser cutters, and/or physical sawing activities.

Size-reduced items and loose material shall be collected and packaged to meet waste acceptance criteria for transfer to suitable storage and disposal facilities.

Cleaning/collection processes are limited to the following various methods or combinations of mechanical cleaning methods, e.g., blast nozzle cleaning, ultra high-pressure water scarification, media blast cleaning (with either vacuum recovered recycled or one shot media, where blast air, media, and radiologically contaminated material are vacuum recovered to prevent dispersion); scabbling (aggressive surface removal of metal and concrete); grinding, and vacuuming.

Liquid decontamination can be employed to reduce contamination levels. This process shall consist of spraying radiologically contaminated surfaces with pressurized liquids and collecting the resultant solutions.

In the final stages of deactivation, after removal of materials in storage in the 327 Building basin, the basin water shall be removed. Appropriate basin surface decontamination/ stabilization shall be conducted.

Spent decontamination solutions and basin water shall be staged in suitably designed tanks, if staging is needed. Treated liquids (filters, ion exchange, basin water, etc.) can be staged in suitably designed and located tanks and transferred to other facilities on the Hanford Site by tanker truck. Smaller volumes might be containerized (e.g., packaged in absorbents in drums or placed in drums or carboys). If tanker trucks are used, displaced air from the tanker trucks shall be routed back to the Zone I or Zone II exhaust systems.

After deactivation efforts have been completed for a particular area of the 327 Building, ventilation ductwork for that area shall be decontaminated, removed, and/or isolated. After sufficient decontamination has been achieved upstream of the associated HEPA filter or control devices, the control devices shall be removed or isolated.

Containment and portable exhausters shall be used as needed for personnel protection in local ventilated spaces for shutting down the existing ventilation system and for ventilating radiologically contaminated areas (piping, ancillary buildings, etc.) outside of areas that are served by the existing 327 Building ventilation system.

Annual maintenance inspections of the 327 Building shall be performed without use of containment or

portable exhausters.

Science and Technology Activities

The 327 Building has been proposed as the host for several hot demonstrations and deployments involving remote characterization, dry decontamination, and handling and size reduction beginning in fiscal year 2002 as part of this effort. The following provides examples of potential areas for science and technology development:

One project involves the demonstration and deployment of remote (in-cell) characterization and dry decontamination. This task shall support several onsite needs including monolithic disposal of the large, cast iron hot cells as non-transuranic (TRU) waste. Another project will involve the remote-handled TRU (RH-TRU) removal and size reduction of a highly contaminated ion exchange column that presently is stored in a water basin in the 327 Building and decontamination of the pool cell. Opportunities exist to expand this effort to include demonstration of removal of contaminated subsystems, such as the pool cell, heating, ventilation, and air conditioning ducting, and the nitrogen recirculation system.

The primary baseline approach for deactivation of the 327 Building hot cells is decontamination using various physical and mechanical means, with some liquid decontamination employed where determined to be appropriate. Based on ALARA, cost, schedule, and regulatory perspectives, it can be advantageous to avoid liquid decontamination (and resultant waste handling) and remove the cells from the building for disposal, with minimal or no decontamination. Hence, the proposed physical/chemical processes include cell removal.

The contaminated ion exchange column shall be removed and size reduced as part of deactivation. The ion exchange column is located under water in the large storage basin, which is 3.0 m (10 ft) wide by 4.6 m (15 ft) long by 5.2 m (17 ft) deep. The column contains an unknown ion exchange media that, based on recent surveys and estimates, contains ~120 curies of cesium.

The 327 Building hot cells duct work and HEPA filters have inventories that are variable depending on what type of development work was performed in the associated hot cell. Large sources of semi-mobile material cannot be left in the building following closure or transition. Hence, the proposed physical/chemical processes shall include removal/disposition of some HVAC system radiological contamination.

The specific need is for the decontamination of highly contaminated (wet) storage basins in the 327 Building. The aforementioned large basin and a small basin [1.8 m (6 ft) by 2.4 m (8 ft) by 3.1 m 10 ft)] are connected by a 0.5 m (1.6 ft) wide by 3.1 m (10 ft) deep canal. The small water basin interfaces with hot cell number "A" to provide the capability for transfer of irradiated material from water storage to hot cell "A." The basins are coated concrete. The storage basins are contaminated with cesium, strontium, uranium, and transuranic components. There is a concentration of contaminants in a 'bathtub ring' located near the surface of the water. In addition to the 'bathtub ring', radioactive contamination has penetrated to varying depths into the concrete wall and floor surfaces. Current decontamination technology consists of physical removal of the concrete surface (i.e., scabbling, sand blasting, etc.). None of these have been demonstrated underwater. Some contaminated concrete surfaces also have been painted and/or coated with a fixative. Project requirements might include removal of such coatings before decontamination of the concrete.

The Special Environment Radiometallurgy Facility (SERF) nitrogen recirculation system is located in the 327 Building. This system was used in the past to filter and cool the nitrogen atmosphere that was maintained in the SERF cell. The SERF cell was used for cutting and examination of irradiated fuel. Inventory and dose data are not complete, but gram quantities of plutonium are present. This system is approximately 2.4 m (8 ft) by 2.4 m (8 ft) by 4.6 m (15 ft) and consists of stainless steel ductwork of various sizes (mainly 6 and 8 inch diameter), two in-line fans, two filtration enclosures, two cooling coils, and two externally mounted compressor/condenser units. The proposed methods of deactivation, removal, and disposal of the SERF cell nitrogen recirculation system shall include those activities as previously described in the process description section titled "General Deactivation Activities".

Excavation:

Excavation shall take place in the vicinity of the 327 Building to support site stabilization and removing/isolating/blanking utilities. Access to underground piping and cable can be gained by use of an excavator. Manual digging methods with shovels, picks, and rakes also could be used. Up to approximately 5 m3 (160 ft3) of soil could be disturbed per activity. Contaminated soil removed during excavation activities shall be covered until replaced into the hole or otherwise dispositioned.

If needed or chosen for use during these activities, the sitewide guzzler, a portable temporary radioactive air emissions unit (PTRAEU) exhauster, or HEPA filtered vacuum radioactive air emission unit shall be used in accordance with the latest revisions of the NOCs ["Categorical Notice of Construction for use of the Guzzler Vacuum Excavation System for Radiologically Limited Activities on the Hanford Site" (approved by WDOH on December 18, 1998) or guzzler NOC', DOE/RL-96-75 and DOE/RL-97-50 respectively].

Excavation activities shall be monitored and evaluated as described below:

Many of the emission controls used during the excavation activities will be administrative, based on ALARA principles and consist of ALARA techniques. It is proposed that these controls be approved as low as reasonably achievable control technology (ALARACT) for excavation in the vicinity of the 327 Building.

1. Health physics technician (HPT) coverage will be provided during all demolition and excavation activities.

2. Appropriate controls such as water, fixatives, covers, containment tents, or windscreens shall be applied, if needed, as determined by the Health Physics organization. Contaminated soil removed during excavation activities shall be covered until replaced into the hole or otherwise dispositioned.

3. After leveling, the soil surface radiological contamination levels shall be verified less than 5,000 disintegrations per minute (dpm)/100 square centimeters (cm2) beta/gamma and less than 100 dpm/100 cm2 alpha. If contamination is present above these levels, soil shall be removed and containerized for disposal or covered or fixed to provide containment of the contamination.

4. If a guzzler, PTRAEU, or HEPA filtered vacuum radioactive air emission unit is used, controls as described in the guzzler NOC, DOE/RL-96-75 or DOE/RL-97-50 shall be followed.

5. If field surveys during excavation identify localized areas of contamination greater than the gross levels described below (i.e., 500,000 dpm/100 cm2 beta/gamma and 3,000 dpm/100 cm2 alpha), additional surveys shall be conducted on the perimeter of the 'hot spot' to verify the localized nature, ensuring that the overall assumed contamination level is not exceeded.

Although no radiological contamination is anticipated, for conservatism it is assumed that the soil surface of a 10 meter perimeter surrounding the 327 Building footprint is contaminated (equating to approximately 2,400 square meters [2.4 x 107 square centimeters]) and that the gross contamination level for beta/gamma (as strontium-90) is limited to 500,000 dpm (per square centimeter).

* (2.4 x 107 cm2 of soil) x (500,000 dpm/cm2) = 1.2 x 1013 dpm

* For cesium-137: 1.9 x 1014 dpm per gram and 86.5 curies per gram

* For strontium-90: 3.1 x 1014 dpm per gram and 139 curies per gram

* At a 2:1 ratio of cesium-137 to strontium-90, 1.2 x 1013 dpm:

(0.67) [(1.2 x 1013)/1.9 x 1014)] 87 = 3.7 curies of cesium-137
(0.33) [(1.2 x 1013)/3.1 x 1014)] 139 = 1.8 curies of strontium-90.

It is recognized that because of historical activities in the 300 Area, isotopes of uranium might be encountered during excavation and decontamination activities. For conservatism, it is assumed that the 10 meter perimeter surrounding the 327 Building footprint is contaminated, and that the gross contamination level is the limit identified on the previous page for alpha [as uranium-234 (consistent with calculations bases in the guzzler NOC)] of 3,000 dpm.

* (2.4 x 107 cm2 of soil) x (3,000 dpm/cm2) = 7.2 x 1010 dpm
* For uranium-234: 1.4 x 1010 dpm per gram and 6.3 x 10-3 curies per gram
* 7.2 x 1010 dpm represents 5.1 grams of uranium-234 = 3.2 x 10-2 curies of uranium-234.

The sitewide guzzler could be used when evidence of low levels of soil contamination is provided. Backfill shall be made with the original material removed or brought in 'clean' soil.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Am - 241	1.10E-05	Cs - 137	5.70E-04	Sr - 90	2.80E-04

5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).

6) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

7) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to

observe such tests (WAC 246-247-060(4)).

8) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10).

9) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

10) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

11) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

12) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

13) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

14) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

15) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

16) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

17) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

18) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

19) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

20) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or

monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

21) After decontamination work is completed in a given area, the duct work for that area must be decontaminated, removed or isolated. After sufficient decontamination work has been done upstream of the associated HEPA filters or control devices, the control devices may be removed or isolated following approval by the department.

22) The APQ for Am-241shall conservatively represent all alpha emitting isotopes.

23) The APQs for Cs-137, Sr-90, and Co-60 shall conservatively represent all beta/gamma emitting isotopes.

24) The APQs for Cs-137 and Sr-90 shall conservatively represent all beta/gamma emitting isotopes.

25) Total emissions from the EP-327-02-V shall not exceed 5.0e-2 mrem/year unabated and 1.7 E-5 mrem/year abated.

Approval Number: AIR 03-107 NOC ID: 505

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: DEACTIVATION OF THE 327 BUILDING

Date Approved: 10-Jan-03

Emission Unit Name: 300 AREA DIFFUSE/FUGITIVE **Emission Unit ID** 443

This is a MINOR, FUGITIVE, non-point source emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **ALARACT** ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential EDE.	As listed in the following Conditions and Limitations.

Sampling Requirements: Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

02/13/2002 NOC, DOE/RL-2002-08 Revision 0, received February 13, 2002. NOC rewrite, DOE/RL-2002-08 Revision 1, received August 15, 2002. Conditions and Limitations, AIR 02-1013 mailed on October 24, 2002.

12/31/2002 Revision form received December 18, 2002 approved via AIR 03-107 dated January 10, 2003 with new Conditions/Limitations. This will be included as a minor modification to the AOP.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) The total abated emission limit for this Notice of Construction is limited to 1.20E-01 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 2.50E+02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

Printed on 10-Jan-03

without prior written approval. The approved activities are limited to:
The deactivation of the 327 Building.

General Deactivation Activities

The general chemical and physical processes associated with deactivation of the 327 Building and associated ancillary facilities shall consist of the following:

Large equipment shall be removed and/or size-reduced, as needed, using processes such as mechanical shearing, cutting torches, laser cutters, and/or physical sawing activities.

Size-reduced items and loose material shall be collected and packaged to meet waste acceptance criteria for transfer to suitable storage and disposal facilities.

Cleaning/collection processes are limited to the following various methods or combinations of mechanical cleaning methods, e.g., blast nozzle cleaning, ultra high-pressure water scarification, media blast cleaning (with either vacuum recovered recycled or one shot media, where blast air, media, and radiologically contaminated material are vacuum recovered to prevent dispersion); scabbling (aggressive surface removal of metal and concrete); grinding, and vacuuming.

Liquid decontamination can be employed to reduce contamination levels. This process shall consist of spraying radiologically contaminated surfaces with pressurized liquids and collecting the resultant solutions.

In the final stages of deactivation, after removal of materials in storage in the 327 Building basin, the basin water shall be removed. Appropriate basin surface decontamination/ stabilization shall be conducted.

Spent decontamination solutions and basin water shall be staged in suitably designed tanks, if staging is needed. Treated liquids (filters, ion exchange, basin water, etc.) can be staged in suitably designed and located tanks and transferred to other facilities on the Hanford Site by tanker truck. Smaller volumes might be containerized (e.g., packaged in absorbents in drums or placed in drums or carboys). If tanker trucks are used, displaced air from the tanker trucks shall be routed back to the Zone I or Zone II exhaust systems.

After deactivation efforts have been completed for a particular area of the 327 Building, ventilation ductwork for that area shall be decontaminated, removed, and/or isolated. After sufficient decontamination has been achieved upstream of the associated HEPA filter or control devices, the control devices shall be removed or isolated.

Containment and portable exhausters shall be used as needed for personnel protection in local ventilated spaces for shutting down the existing ventilation system and for ventilating radiologically contaminated areas (piping, ancillary buildings, etc.) outside of areas that are served by the existing 327 Building ventilation system.

Annual maintenance inspections of the 327 Building shall be performed without use of containment or portable exhausters.

Science and Technology Activities

The 327 Building has been proposed as the host for several hot demonstrations and deployments involving remote characterization, dry decontamination, and handling and size reduction beginning in fiscal year 2002 as part of this effort. The following provides examples of potential areas for science and technology development:

One project involves the demonstration and deployment of remote (in-cell) characterization and dry decontamination. This task shall support several onsite needs including monolithic disposal of the large, cast iron hot cells as non-transuranic (TRU) waste. Another project will involve the remote-handled TRU (RH-TRU) removal and size reduction of a highly contaminated ion exchange column that presently is stored in a water basin in the 327 Building and decontamination of the pool cell. Opportunities exist to expand this effort to include demonstration of removal of contaminated subsystems, such as the pool cell, heating, ventilation, and air conditioning ducting, and the nitrogen recirculation system.

The primary baseline approach for deactivation of the 327 Building hot cells is decontamination using various physical and mechanical means, with some liquid decontamination employed where determined to be appropriate. Based on ALARA, cost, schedule, and regulatory perspectives, it can be advantageous to avoid liquid decontamination (and resultant waste handling) and remove the cells from the building for disposal, with minimal or no decontamination. Hence, the proposed physical/chemical processes include cell removal.

The contaminated ion exchange column shall be removed and size reduced as part of deactivation. The ion exchange column is located under water in the large storage basin, which is 3.0 m (10 ft) wide by 4.6 m (15 ft) long by 5.2 m (17 ft) deep. The column contains an unknown ion exchange media that, based on recent surveys and estimates, contains ~120 curies of cesium.

The 327 Building hot cells duct work and HEPA filters have inventories that are variable depending on what type of development work was performed in the associated hot cell. Large sources of semi-mobile material cannot be left in the building following closure or transition. Hence, the proposed physical/chemical processes shall include removal/disposition of some HVAC system radiological contamination.

The specific need is for the decontamination of highly contaminated (wet) storage basins in the 327 Building. The aforementioned large basin and a small basin [1.8 m (6 ft) by 2.4 m (8 ft) by 3.1 m 10 ft)] are connected by a 0.5 m (1.6 ft) wide by 3.1 m (10 ft) deep canal. The small water basin interfaces with hot cell number "A" to provide the capability for transfer of irradiated material from water storage to hot cell "A." The basins are coated concrete. The storage basins are contaminated with cesium, strontium, uranium, and transuranic components. There is a concentration of contaminants in a 'bathtub ring' located near the surface of the water. In addition to the 'bathtub ring', radioactive contamination has penetrated to varying depths into the concrete wall and floor surfaces. Current decontamination technology consists of physical removal of the concrete surface (i.e., scabbling, sand blasting, etc.). None of these have been demonstrated underwater. Some contaminated concrete surfaces also have been painted and/or coated with a fixative. Project requirements might include removal of such coatings before decontamination of the concrete.

The Special Environment Radiometallurgy Facility (SERF) nitrogen recirculation system is located in

the 327 Building. This system was used in the past to filter and cool the nitrogen atmosphere that was maintained in the SERF cell. The SERF cell was used for cutting and examination of irradiated fuel. Inventory and dose data are not complete, but gram quantities of plutonium are present. This system is approximately 2.4 m (8 ft) by 2.4 m (8 ft) by 4.6 m (15 ft) and consists of stainless steel ductwork of various sizes (mainly 6 and 8 inch diameter), two in-line fans, two filtration enclosures, two cooling coils, and two externally mounted compressor/condenser units. The proposed methods of deactivation, removal, and disposal of the SERF cell nitrogen recirculation system shall include those activities as previously described in the process description section titled "General Deactivation Activities".

Excavation:

Excavation shall take place in the vicinity of the 327 Building to support site stabilization and removing/isolating/blanking utilities. Access to underground piping and cable can be gained by use of an excavator. Manual digging methods with shovels, picks, and rakes also could be used. Up to approximately 5 m3 (160 ft3) of soil could be disturbed per activity. Contaminated soil removed during excavation activities shall be covered until replaced into the hole or otherwise dispositioned.

If needed or chosen for use during these activities, the sitewide guzzler, a portable temporary radioactive air emissions unit (PTRAEU) exhauster, or HEPA filtered vacuum radioactive air emission unit shall be used in accordance with the latest revisions of the NOCs ["Categorical Notice of Construction for use of the Guzzler Vacuum Excavation System for Radiologically Limited Activities on the Hanford Site" (approved by WDOH on December 18, 1998) or guzzler NOC', DOE/RL-96-75 and DOE/RL-97-50 respectively].

Excavation activities shall be monitored and evaluated as described below:

Many of the emission controls used during the excavation activities will be administrative, based on ALARA principles and consist of ALARA techniques. It is proposed that these controls be approved as low as reasonably achievable control technology (ALARACT) for excavation in the vicinity of the 327 Building.

1. Health physics technician (HPT) coverage will be provided during all demolition and excavation activities.

2. Appropriate controls such as water, fixatives, covers, containment tents, or windscreens shall be applied, if needed, as determined by the Health Physics organization. Contaminated soil removed during excavation activities shall be covered until replaced into the hole or otherwise dispositioned.

3. After leveling, the soil surface radiological contamination levels shall be verified less than 5,000 disintegrations per minute (dpm)/100 square centimeters (cm2) beta/gamma and less than 100 dpm/100 cm2 alpha. If contamination is present above these levels, soil shall be removed and containerized for disposal or covered or fixed to provide containment of the contamination.

4. If a guzzler, PTRAEU, or HEPA filtered vacuum radioactive air emission unit is used, controls as described in the guzzler NOC, DOE/RL-96-75 or DOE/RL-97-50 shall be followed.

5. If field surveys during excavation identify localized areas of contamination greater than the gross levels described below (i.e., 500,000 dpm/100 cm2 beta/gamma and 3,000 dpm/100 cm2 alpha),

additional surveys shall be conducted on the perimeter of the 'hot spot' to verify the localized nature, ensuring that the overall assumed contamination level is not exceeded.

Although no radiological contamination is anticipated, for conservatism it is assumed that the soil surface of a 10 meter perimeter surrounding the 327 Building footprint is contaminated (equating to approximately 2,400 square meters [2.4 x 107 square centimeters]) and that the gross contamination level for beta/gamma (as strontium-90) is limited to 500,000 dpm (per square centimeter).

* (2.4 x 107 cm2 of soil) x (500,000 dpm/cm2) = 1.2 x 1013 dpm

* For cesium-137: 1.9 x 1014 dpm per gram and 86.5 curies per gram

* For strontium-90: 3.1 x 1014 dpm per gram and 139 curies per gram

* At a 2:1 ratio of cesium-137 to strontium-90, 1.2 x 1013 dpm:

(0.67) [(1.2 x 1013)/1.9 x 1014)] 87 = 3.7 curies of cesium-137
(0.33) [(1.2 x 1013)/3.1 x 1014)] 139 = 1.8 curies of strontium-90.

It is recognized that because of historical activities in the 300 Area, isotopes of uranium might be encountered during excavation and decontamination activities. For conservatism, it is assumed that the 10 meter perimeter surrounding the 327 Building footprint is contaminated, and that the gross contamination level is the limit identified on the previous page for alpha [as uranium-234 (consistent with calculations bases in the guzzler NOC)] of 3,000 dpm.

* (2.4 x 107 cm2 of soil) x (3,000 dpm/cm2) = 7.2 x 1010 dpm
* For uranium-234: 1.4 x 1010 dpm per gram and 6.3 x 10-3 curies per gram
* 7.2 x 1010 dpm represents 5.1 grams of uranium-234 = 3.2 x 10-2 curies of uranium-234.

The sitewide guzzler could be used when evidence of low levels of soil contamination is provided. Backfill shall be made with the original material removed or brought in 'clean' soil.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Cs - 137	4.00E-01	Sr - 90	1.90E-01	U - 234	3.20E-02

5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).

6) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

7) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

8) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

9) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts,

and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

10) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

11) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

12) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

13) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping and reporting requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

14) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

15) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10).

16) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

17) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

18) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

19) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H (WAC 246-247-080(2)).

20) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

21) Diffuse/Fugitive emissions shall be monitored using the 300 Area near-field ambient air monitors. Sample collection and analysis shall follow that of the near field monitoring program. Analytical results shall be reported in the Annual Air Emissions Report. Any change to this near-field ambient monitoring program must be approved by the department.

22) For areas being deactivated outside of areas served by the EP-327-01-S or EP-327-02-V ventilation system, containment and portable exhausters shall be used as needed for protection of human health or the environment, consistent with department requirements.

23) When a HEPA Filtered Vacuum Radioactive Air Emission Unit (HEPA VAC) is used during tie-in activities (e.g., utilities or piping), the conditions, controls, monitoring requirements and limitations of the HEPA VAC NOC, latest approved version, shall be required.

24) When a Portable/Temporary Radioactive Air Emission Unit (PTRAEU) is used during 327 Deactivation activities, the conditions, controls, monitoring requirements and limitations of the PTRAEU NOC, latest approved version, shall be required.

25) When a sitewide guzzler is used during 327 Deactivation activities, the conditions, controls, monitoring requirements and limitations of the 'guzzler NOC', latest approved version, shall be required.

26) The APQ for U-234 shall conservatively represent all alpha emitting isotopes.

27) The APQs for Cs-137 and Sr-90 shall conservatively represent all beta/gamma emitting isotopes.

28) Total emissions from excavations shall not exceed 3.6 E-2 mrem/year unabated and abated.

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) HLW VITRIFICATION PLANT

Emission Unit Name: HV-S3A **Emission Unit ID 551**

This is a MAJOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	Film Cooler	1	One in operation.
	Submerged Bed Scrubber	1	One in operation.
	Wet Electrostatic Precipitator	1	One in operation.
	Injection Air	1	Operational.
	High Efficiency Mist Eliminator	2	One in operation and one in standby.
	Heater	2	One in operation and one in standby.
	HEPA	2	Two stages of HEPA filtration. A total of two banks of primary HEPAs one in operation and one in standby. Each bank contains two filters. A total two banks of secondary HEPAs one in operation and one in standby. Each bank contains two filters.
	Heat Exchanger	1	One in operation.
	Booster Fan	3	Two in operation and one in standby.
	Heat Exchanger	1	One in operation
	Silver Mordenite Adsorber	1	One in operation.
	Fan	3	Two in operation and one in standby

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114	Am-241, Cm-243, Cm-244, Cs-137, Eu-152, Eu-154, Eu-155, I-129, Np-237, Pu-238, Pu-239, Pu-240, Pu-241, Sb-125, Sm-151, Sr-90, Tc-99, U-233, U-234, Y-90, Ru-106, Cs-134, Ra-226, U-232, Pa-	Continuous

231, AC-227, Am-243, H-3,
Sn-126, Cm-242.

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with typographical changes, AIR 03-1012, mailed on October 23, 2003.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

the receipt of high-level waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit HV-S3a is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a film cooler, a Submerged Bed Scrubber (SBS), a Wet Electrostatic Precipitator (WESP), an injection of air delivered through a Vessel Vent Header (S 127 Stream), a High Efficiency Mist Eliminator (HEME), a Heater, two stages of High-Efficiency Particulate Air (HEPA) filtration in series, a Heat Exchanger, a Booster Fan, a 2nd Heat Exchanger, a Silver Mordenite Bed, routed back through the 1st Heat Exchanger, and Exhaust Fans. Control technologies for operation of the emission unit that are not regulated by this license (located between the 2nd Heat Exchanger and the Silver Mordenite Bed) are a Heater, a Thermal Catalytic Oxidizer, a Selective Catalytic Reduction unit, and routed back through the 2nd Heat Exchanger.

The maximum differential pressure across each filter HEPA bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

The inlet airstream temperatures for each HEPA filter bank shall be measured by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The temperature differential shall be controlled to ensure Relative Humidity (RH) is within acceptable

limits. The moisture content of the inlet airstream for each HEPA filter bank shall be measured by a capacitive moisture sensor that is specified to be tolerant of particulate contamination and most chemicals. The dewpoint of offgas air flow shall be measured and subsequently controlled by temperature to ensure that the air stream is above its dewpoint in order to prevent condensation in offgas treatment equipment such as HEPA filters. The various component selections for moisture sensor instruments shall be based on factors that include range, accuracy, offgas stream constituents, and radiation levels.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:

The emission source to emission unit HV-S3 shall consist of off-gases from the HLW melter and process vessels.

HLW Melter Feed System (C5)

Treated HLW feed shall be analyzed to determine the glass additive formulation for the conversion of the waste to glass. The glass additives specified in the formulation shall be weighed and blended in the HLW glass former feed system, and subsequently mixed with the treated HLW waste. The HLW glass former feed system shall have no potential to emit radioactive air emissions. The HLW melter feed shall comprise the mixture of glass formers and treated HLW waste.

The HLW melter feed shall be transferred to each melter with air displacement slurry pumps. The pumps shall transfer the slurry from the feed vessel to the melter utilizing air as the motive force. The melter feed nozzles shall be installed in the melter lid for introduction of slurry over the melt pool cold cap. Each feed nozzle shall be individually supplied from a separate pump to reduce the likelihood of line plugging. The feed nozzles shall be insulated with ceramics to prevent drying the feed before it reaches the melter. Water flushes shall be used to clear the feed lines as necessary.

The feed rate to the melter pool shall be determined based on the average plenum temperature in the melter. The plenum temperatures shall be controlled in the range of between 400 °C and 500 °C (752 °F and 932 °F). The plenum thermocouples shall be used to monitor plenum temperature and change the rate of feeding to the melter.

HLW Melter (C5)

The single HLW melter shall have a single internal glass chamber with a rectangular surface area. The melter shall be lined with refractory material designed to withstand corrosion by molten glass. The energy for the melt shall be delivered by three sets of electrodes mounted on opposite walls of the glass pool. The nominal melter glass pool temperature is 950 °C to 1250 °C (1742 °F to 2282 °F). The glass shall be discharged through either of two discharge chambers located within one of the long axis

walls of the melter. The steel casing for the melter area shall be provided with water cooling to maintain a thermal gradient in the bricks for corrosion control, prevent migration of glass through the bricks, and reduce heat load to the process cell. The lid of the HLW melter shall be sealed to the melter shell in order to provide gas containment. The lid shall provide a support structure through which sub-components can be mounted for submersion in the melt pool and suspension in the melter plenum. Penetrations, primarily on the lid, through the outer shell are sealed by appropriate fittings that allow remote removal and replacement. The HLW melter shall be remotely operated and maintained.

Melter Containment System

The refractory shall be part of the melter containment and consists of two separate sections. One section shall be the refractory in contact with the molten glass pool, and the other refractory section shall surround the gas space above the glass pool, which is commonly referred to as the plenum. The glass pool refractory, in conjunction with active cooling provided by a water jacket, shall provide glass containment, thermal insulation, and electrical isolation. A steep temperature gradient through the refractory shall be established to 'freeze' glass mid-way within the refractory wall. The refractory shall be held under compression with special bolts so that no gaps exist in the joints to allow molten glass penetration. The plenum refractory shall be primarily designed to resist thermal shock, resist corrosion by offgases, and to resist corrosion by splashed feed and glass. Two refractory thermowells shall monitor the condition of the melter structure. The thermowells shall be located at a joint between the two refractory layers. The containment shells shall be designed to prevent glass leaks in the unlikely event of refractory failure.

Materials within the HLW vitrification plant shall be selected to prevent corrosion. For example, to prevent corrosion from acidic solutions within the SBS and the associated condensate vessels, these vessels shall be constructed of Hastelloy C-22. The SBS waste collection vessel shall be constructed of a 6 % molybdenum alloy, and the associated cooling jackets shall be constructed of 304L stainless steel. The WESP and the HEME, which are downstream from the SBS system, shall also be constructed of a 6 % molybdenum alloy. 316L stainless steel shall be used for the construction of all components downstream from the WESP or the HEME.

The melter shell shall consist of the lid and base plate, as well as the structure needed to support the lid. The melter shell shall be designed to allow operation of the melter at a negative pressure with air in-leakage from the melter cave. The pressure differential between the melter cave and the inside of the melter shall be maintained so as to create the air in-leakage to reduce the deposition of corrosive materials such as sodium borate and lithium borate, to the spaces between the gas barrier and the refractory.

The HLW melter shall be operated under a cascaded ventilation system. The melter plenum shall be maintained at a vacuum with offgas system blowers and controlled injection of air into the offgas line near the melter exhaust. The flowrate of the injection air shall be automatically controlled, based on melter plenum pressure, so that a relatively constant melter pressure shall be maintained although the melter offgas generation rate fluctuates. This shall ensure containment and avoid pressurization.

The melter shell shall have a drain located in the base-plate between the shell and the glass pool refractory. The drain shall prevent the backup of water in the event of a cooling water leak or the uncontrolled addition of water from other sources. The drain shall have a sealing mechanism to

prevent the inward flow of air due to melter vacuum and a leak detection system.

Joule Heating

The heat for the HLW melter startup shall be provided by temporarily installed radiant electric heaters mounted through the lid of the melter. These heaters shall melt the starter charge of frit sufficiently to make it conductive between the melter's Joule-heating electrodes. When a conducting path is established, the melter shall be heated in a controlled manner by passing more and more current between the electrodes through the glass (a process known as Joule-heating). Slurry feeding shall start when the melter reaches its operating temperature.

No radioactive air emissions shall be generated when the radiant heaters are removed after initial startup because the process fluid is not radioactive. Removal of the heater from the melter shall be performed with an air sweep into the melter to prevent significant releases of contaminants. The air sweep shall be drawn into the offgas system.

The Joule-heating system shall comprise the melter electrodes, electrode power supplies, melter glass pool thermocouples, and the electrode control system.

The electrode configuration for each HLW melter shall consist of three plate electrodes, two mounted on opposite sides of the melter and one on the bottom. The electrodes shall be cooled by forced air and have forced-air cooled electrode extensions. The extensions shall penetrate the side of the melter below the glass level to minimize the effects of thermal expansion and to minimize the potential for sulfate corrosion. Active cooling of the extensions and the use of a water-cooling jacket shall prevent glass from migrating through the refractory package adjacent to the electrode extension penetrations. Power to the electrodes shall be single-phase alternating current applied across opposing electrodes. The nominal glass melt pool temperature shall be between 950 °C and 1250 °C (1742 °F and 2282 °F). This shall be measured with thermocouples in thermowells submerged into the pool at various locations. The power to the electrodes shall be regulated to maintain the temperature at the nominal value.

Glass Discharge System

The HLW melter shall have two identical and independently operated glass discharge systems located adjacent to each other on a long side of the melter. The glass discharge systems shall include the melter glass level detectors, canister glass level detection, riser, airlift lance, trough, and a heated discharge chamber.

The glass discharge from the melter shall be initiated by injecting air or an inert gas at the bottom of the airlift riser. As the gas bubbles rise in the glass, they shall entrain glass in the riser to the inlet of the trough. The glass shall then flow into the waste canister. The rate of glass discharge shall be controlled by adjusting the rate at which the air and gas mixture is injected into the bottom of the riser.

The starting and stopping of the glass discharge shall be based on the level of glass in the melter. The glass level in the melt pool shall be maintained to within an approximate 1-in. band to reduce thermal stresses on the refractory. Glass discharge operations shall be monitored using a camera system to observe the glass pour stream. The level in the waste canister shall also be monitored via infrared thermal imaging and gamma level detectors to prevent overfilling.

HLW Canister Handling System

The pour tunnels shall be located south of the melter caves and shall extend in the north-south direction. A cart and rail system shall extend further under the melter cave, allowing a standby cart to be positioned under the melter when the process cart is in the pour position. The rails shall be isolated from the melter cave with steel contamination control barriers. The cart decontamination areas shall be located south of the melter caves and north of the pour tunnel cart maintenance room.

When a canister is required for filling of the IHLW, it shall be taken out of the buffer rack in the canister handling cave using the canister handling cave crane and transferred above the appropriate pour tunnel hatch. The hatch shall be opened and the canister handling cave crane will load the empty canister into the pour tunnel cart. The grapple shall be released and raised, and the hatch shall be closed. The cart shall travel north to the lidding device. At the lidding device, the primary cart shall move up to the standby cart and latch onto it. The primary cart shall then be in position with the lid removed. The standby cart shall be shunted along the track until the primary cart is in position under the pour spout. The primary cart shall then be in position, the pour spout shall be lowered onto the canister flange, and the canister shall be filled with IHLW.

After completion of filling, the canister shall remain at the pour spout for approximately 1 hour to allow a "skin" to form over the glass, which shall provide a seal to prevent additional off-gassing. The pour spout shall then be retracted, and the primary cart shall be unlocked and moved back. This sequence shall also move the standby cart back under the pour spout. The filled canister shall be allowed to cool prior to removal from the pour tunnel. The primary cart shall then be unlatched from the standby cart and moved south in the pour tunnel until it is beneath the canister handling cave hatch. The hatch shall be opened, the canister handling cave crane shall remove the full canister, and the hatch shall be closed. The filled canister shall then be cooled in cooling racks in preparation for welding the lid in place. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110 (10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet

designed. [WAC 246-247-110 (5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) & (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) & (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

    Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing

around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

    Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for

entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) (a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B. dated November 04, 2002. [WAC 246-247-120]

(b) Emission unit components design, construction, testing, and operation different from those identified in the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

(c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

(d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, valves, piping, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The annual IHLW production from the HLW plant shall not exceed 1.095E3 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110 (10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test

facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080(7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges;
-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The USDOE shall provide manufacturer's specifications and/or research and development data, including published removal efficiencies and installation requirements, to demonstrate to WDOH that the Submerged Bed Scrubber (SBS), Wet Electrostatic Precipitator (WESP), High Efficiency Mist Eliminator (HEME), and Silver Mordenite Bed in this emission control unit are intended to operate at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. This information shall be provided to the WDOH at least 90 days prior to hot commissioning.

Where actual measurements are impossible, the USDOE shall provide to the WDOH for approval prior to hot startup sufficient information to demonstrate that the control equipment has been installed in accordance with manufacturers' specifications and that the manufacturers' specifications shall achieve design removal efficiencies. Where the application depends on research and development data, the USDOE shall provide to the WDOH for approval prior to hot startup sufficient information to

demonstrate that the control equipment has been installed in a manner consistent with the conditions under which the research and development data was obtained. [WAC 246-247-120]

40) The differential pressure across each HEPA filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

41) If temperatures of air entering the HEPA filters exceed the manufacturer's recommendations for the filters, WDOH shall be notified and the cause of the temperature excursion shall be determined. HEPA filters shall be evaluated for the need to be replaced. [WAC 246-247-120]

42) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

43) The USDOE shall notify the WDOH before initiating use of the maintenance ventilation bypass line for the Submerged Bed Scrubber (SBS) and the Wet Electrostatic Precipitator (WESP). Prior to initiating use of the maintenance ventilation bypass line for the SBS and the WESP, waste feed to the HLW Melter shall be halted, and the melter shall be placed into an idle condition. All emissions control system components for emission unit HV-S3 shall remain online for sufficient time after initiation of melter idling to allow the cold cap to burn off. While the SBS/WESP maintenance bypass line is in use, offgas shall be treated with all other emission control systems for emission unit HV-S3, including the HEME, HEPA filtration, and Silver Mordenite Bed. Temperature of the offgas air stream leaving the HLW melter shall be sufficiently low (less than 400 oC) to ensure that cesium-137 and technetium-99 are in aerosol form and are captured by the HEPA filters.

Prior to hot commissioning, appropriate procedures to initiate this by-pass system shall be established, and documentation describing these procedures shall be provided to WDOH for review and approval. [WAC 246-247-120]

44) The differential pressure across the SBS shall be monitored, recorded, and trended. Prior to hot commissioning, parameters appropriate for measuring the performance of the SBS and operating ranges for these parameters shall be established and presented to WDOH for approval. [WAC 246-247-120]

45) Alternate power supplied by diesel generators shall be available for the exhaust fans upon loss of normal facility electrical power. [WAC 246-247-120]

46) The WDOH shall be notified prior to installation of the mechanical reamer for the HLW film cooler. [WAC 246-247-120]

47) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002.

Emission unit HV-S3 shall be continuously monitored. Radionuclides which contribute 10% of the unabated dose or greater, or produce an unabated dose of 0.1mrem/yr, and radionuclides that contribute 25% of the abated dose or greater shall be sampled, analyzed, and reported. The HV-S3 emission unit sampling system shall be designed to analyze at a minimum the following radionuclides: Am-241, C-

-14, Co-60, Cm-243, Cm-244, Cs-137, Eu-152, Eu-154, Eu-155, I-129, Np-237, Pu-238, Pu-239, Pu-240, Pu-241, Sb-125, Sm-151, Sr-90, Tc-99, Th-232, U-233, U-234, Y-90, Ru-106,Cs-134, Ra-226, U-232, Pa-231, Ac-227, and Am-243.

Prior to hot commissioning, a procedure to manage down time or failure time of continuous sampling and monitoring equipment shall be developed, and documentation describing this procedure shall be submitted to WDOH for review and approval. [WAC 246-247-040(1); WAC 246-247-075]

48) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

49) A new air sampling station shall be established at a distance of approximately 1500 meters in the ESE direction from WTP. This sampling station is hereinafter called the "New Station".

50) The following ambient air sampling stations shall be operated as a monitoring network, with all sampling, analysis, interpretation, and reporting to managed as a single entity: a) the New Station, b) Vit Plant North, c) B Pond, d) 200 ESE, e) N-977, f) N-985, g) N-158, h) N-984, i) N-498, j) N-499, k) West End Fir Road.

51) At all 11 of these stations the following air sampling regime shall be conducted: a) gross alpha/gross beta samples shall be collected on a bi-weekly basis (particulate air filters operated for two-week periods); b) particulate air samples shall be composited on a monthly basis and analyzed by gamma scan for the following radionuclides: Ru-106, Sb-125, Cs-134, Cs-137, Eu-154, and Am-241, plus any other radionuclides with positive activities greater than the MDA; and c) particulate air samples shall be composited on a quarterly basis and analyzed with appropriate radiochemical methods for Sr-90Sr and Pu-239-240.

52) At the New Station, the Station at 200 ESE, and the Station at the West End of Fir Road, the following additional air samples shall be collected: a) tritium samples shall be obtained with silica gel or molecular sieve filters, collected approximately monthly, and the extracted moisture shall be analyzed by liquid scintillation; b) continuous air samples shall be collected on a monthly basis with appropriate sample media and analyzed with appropriate radiochemical techniques for C-14; and c) continuous air samples shall be collected with appropriate media and combined on a quarterly basis to be analyzed with appropriate radiochemical techniques for I-129.

53) Sampling and sample analysis regimes used for WTP ambient air monitoring shall meet or exceed the following minimum detectable concentrations over the above specified sampling periods:

ANALYSIS	Minimum Detectable Concentration
Gross Alpha:	0.001 pCi/m3
Gross Beta:	0.003 pCi/m3
Tritium:	3 pCi/m3
Strontium-90 :	0.0001 pCi/m3
Iodine-129:	0.00001 pCi/m3
Gamma Scan (137Cs) :	0.01 pCi/m3
Pu Isotopic :	0.000005 pCi/m3
Americium-241:	0.00005 pCi/m3

54) Preoperational monitoring shall be performed to obtain a baseline of all analytes prior to commencement of processing of radioactive waste at the WTP. A baseline dataset of 12 contiguous months of validated data shall be provided to WDOH for review and approval.

55) The operational status of the data management system for collecting, validating, and evaluating WTP ambient monitoring data shall be demonstrated to WDOH by providing in report form the baseline dataset of 12 contiguous months of validated data of all analytes for review and approval.

56) Validated gross beta sample results from all 10 stations shall be reported within 30 days of sample collection, and all data shall be promptly analyzed for trends.

57) All HEPA filter banks in this unit's emission control system shall be subjected to acrosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

58) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

59) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas associated with this emission unit. [WAC 246-247-120]

60) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

61) The USDOE shall notify the WDOH before initiating replacement of a melter unit in the HLW. Prior to initiating replacement of the melter unit, waste feed to the HLW Melter shall be halted, and the melter shall be placed into an idle condition. All emissions control system components for emission unit HV-S3 shall remain online for a minimum period of time after initiation of melter idling to allow the cold cap to burn off. Prior to hot commissioning, appropriate procedures to initiate replacement of a failed melter shall be established and submitted to WDOH for review and approval. [WAC 246-247-120]

Approval Number: AIR 03-1012 NOC ID: 509

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) HLW VITRIFICATION PLANT

Emission Unit Name: HV-S4 **Emission Unit ID** 552

This is a MAJOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	Heater	1	One in operation.
	HEPA	2	Two stages of HEPA filtration. A total of two banks of primary HEPAs one in operation and one in standby. Each bank contains five filters. A total two banks of secondary HEPAs one in operation and one in standby. Each bank contains five filters.
	Fan	3	Two in operation and one in standby

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114	Radionuclides which contribute 10% to the unabated dose or greater, produce an unabated dose of 0.1 mrem/yr, and radionuclides that contribute 25% of the abated dose or greater. This shall include Cs-137, Am-241, and Sr-90.	Continuous

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with typographical changes, AIR 03-1012, mailed on October 23, 2003.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license

Printed on 22-Oct-03

1) (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**
the receipt of high-level waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit HV-S4 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a heater, two stages of High-Efficiency Particulate Air (HEPA) filtration in series, and exhaust fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

The inlet airstream temperature for each HEPA filter bank shall be measured by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The temperature differential shall be controlled to ensure Relative Humidity (RH) is within acceptable limits. The moisture content of the inlet airstream for each HEPA filter bank shall be measured by a capacitive moisture sensor that is specified to be tolerant of particulate contamination and most chemicals. The dewpoint of offgas air flow shall be measured and subsequently controlled by temperature to ensure that the air stream is above its dewpoint in order to prevent condensation in offgas treatment equipment such as HEPA filters. The various component selections for moisture sensor instruments shall be based on factors that include range, accuracy, offgas stream constituents, and radiation levels.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:

Exhaust from the Reverse-Flow Diverters/Pulse Jet Mixers (RFD/PJMs) shall be vented through emission unit HV-S4. The RFD/PJMs shall be used within the HLW plant for metered transfer of liquids or slurries throughout the HLW process. The following is a description of the operation of an RFD:

Operation of the RFD is cyclical, following timed phases: suction phase, drive phase, and blowdown.

Suction Phase

In the suction phase, the secondary automatic valve is opened, admitting air to the suction jet pump. A second valve is then shut, and liquid is drawn from the supply tank through the RFD and into the charge vessel. The suction ejector is designed so that it cannot produce a vacuum capable of lifting liquid higher than the suction lift valve. The liquid reaches this "suction lift" height and stops, and then the first valve is shut.

Drive Phase

When the first valve is shut, the second valve is opened, admitting air to the drive nozzle. Air passes through the nozzle and pressurizes the charge vessel. Liquid is forced across the RFD and into the delivery pipe. The delivery pipe is then filled with liquid that flows into the delivery vessel.

Blowdown phase

When the charge vessel is nearly empty, the second valve is shut; no air is supplied to either jet pump. The compressed air in the charge vessel passes back through the paired jet pumps, down the vent pipe, and into the vessel vent system.

Shortly after blowdown begins, the pressure in the charge vessel falls below the delivery head, and the flow of liquid into the delivery vessel is halted. The liquid in the delivery vessel then falls back down the pipe, across the reverse flow diverter, and into the charge vessel. After a short time, the pressure in the charge vessel falls to zero (gauge). The cycle is now complete.

The exhausts for the PJV system originate from the operation of the RFDs and the PJM pulse tubes located below the liquid level in the process vessels. These fluidic devices use motive compressed air to lower and raise the level of liquid in the charge vessels located within the process vessel for the purpose of mixing via PJMs and fluid transfer via RFDs. Even though the total air flow from all the RFDs and PJMs is significant, only a small fraction of this air passes through the charge vessels, the remainder being the motive air for the suction jets used to draw suction on the charge vessels.

Compressed air supply to the jet pumps used for the fluidic mixing devices for the process vessels pushes the liquid out to the lower operating level in the charge vessel during the mixing drive cycle or the RFD drive phase. The gases from the charge vessel are exhausted during the suction cycle by another jet pump to the RFD/PJM exhaust header so that the operating level will rise to the upper limit in the charge vessel. The combination of the suction and discharge cycles provides the required mixing in the process vessel.

Controls shall be provided for the compressed air supply to the RFD/PJMs to avoid a flow surge into the vapor space inside the process vessel, referred to as "overblow". The air lines in the air supply

backs that vent the PJMs and RFD charge vessels have pressure sensors to control the air flow. These pressure sensors detect the significant difference in backpressure that occurs at the point when air instead of liquid flows through the PJM nozzle or RFD line. The pressure sensors then send a signal to close the drive air supply valves and alert the operator of the overblow situation. Once detected, the cycle shall be adjusted to avoid overblow on subsequent cycles.

The time that air blows into the vessel is a period of a few seconds. The quantity of air that discharges to the vessel during an overblow is small compared to the capacity of the vessel vent system and shall contribute no significant potential to emit. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246 247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110 (5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) and (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) and (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity,

shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) (a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002. [WAC 246-247-120]

(b) Emission unit components design, construction, testing, and operation different from those identified in the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated

November 04, 2002 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

(c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

(d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, valves, piping, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The annual IHLW production from the HLW plant shall not exceed 1.095E3 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110(10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080(7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges,
-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

40) The differential pressure across each HEPA filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

41) The USDOE shall prepare documentation which a) identifies the critical operating parameters for pulse jet mixers (PJMs) and reverse flow diverters (RFDs) used in HLW processes, and b) prescribes a program to determine the acceptable operating ranges for these parameters during cold commissioning. Prior to cold commissioning the USDOE shall provide documentation describing the procedure(s))) and an adequate list of indicator parameters as well as appropriate indicator device's) for each parameter to the WDOH for review and approval. The USDOE shall determine acceptable operating ranges for these parameters and shall develop operating procedures to maintain the PJMs and RFDs within these ranges. The USDOE shall present these ranges and documentation describing the maintenance and operating procedures for approval prior to accepting radioactive material into the WTP. [WAC 246-247-120]

42) If temperatures of air entering the HEPA filters exceed the manufacturer's recommendations for the filters, WDOH shall be notified and the cause of the temperature excursion shall be determined. HEPA filters shall be evaluated for the need to be replaced. [WAC 246-247-120]

43) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

44) Alternate power supplied by diesel generators shall be available for the exhaust fans upon loss of normal facility electrical power. [WAC 246-247-120]

45) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002.

Emission unit HV-S4 shall be continuously sampled. Radionuclides which contribute 10% of the

unabated dose or greater, produce a unabated dose of 0.1mrem/yr, and radionuclides that contribute 25% of the abated dose or greater shall be sampled, analyzed, and reported. This shall include at a minimum Am-241, Cs-137, and Sr-90.Prior to hot commissioning, a procedure to manage down time or failure time of continuous sampling equipment will be developed, and documentation describing this procedure shall be submitted to WDOH for review and approval. [WAC 246-247-040 (1); WAC 246-247-075]

46) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 Sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

47) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

48) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

49) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas associated with this emission unit. [WAC 246-247-120]

50) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) HLW VITRIFICATION PLANT

Emission Unit Name: HV-C2 **Emission Unit ID** 553

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	One stage of HEPA filtration. A total of seven banks of primary HEPAs six in operation and one in standby. Each bank contains six filters.
	Exhaust Fan	2	Two in operation.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Gross Alpha and Gross Beta/Gamma	Shall be determined prior to cold commissioning

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with typographical changes, AIR 03-1012, mailed on October 23, 2003

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

the receipt of high-level waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit HV-C2 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a single stage of High-Efficiency Particulate Air (HEPA) filtration, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

Space temperatures from which C2 air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The C2V exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:

The emission source to emission unit HV-C2 shall consist of exhausts from plant building C2 ventilation systems. The exhaust from the HLW facility C2 ventilation system shall be vented through emission unit HV-C2. A portion of the air supplied to the C2 areas shall be cascaded into adjacent C3 areas with the rest being directly exhausted by the C2 exhaust system. C2 areas can normally be accessed by personnel in street clothes, and personal protective equipment is not required in C2 areas. The C2 system exhaust fans shall be interlocked with the C5 exhaust system fans and shall shut down in the event of a failure of the C5 exhaust system to prevent flow reversal.

The C2 ventilation system shall serve the non-process operating areas, such as hallways, instrument control and instrumentation room, and electrical and mechanical equipment rooms. Access from C2

areas into a C3 area shall be through a C2/C3 sub-change room, so that the majority of C2 designated areas shall have no potential to emit radioactive emissions. However, a potential for radioactive emissions may occur in C2 areas which are used as a transport to move packaged secondary wastes to the outside of the facility or to move failed equipment to the C3 maintenance workshop. C2 activities with potential to create radioactive emissions are:

Transport of bagged failed manipulator for repair within the C3 workshop;
Transport of packaged failed melter for storage at the Balance of Facilities area (BOF);
Transport of packaged melter consumables;
Transport of containerized failed equipment for storage at the BOF;
Transport of containerized miscellaneous wastes for storage at the BOF;
Transport of contaminated personal protective equipment;
Transport of process samples by means of an autosampler;
Filter changeout, aerosol testing, and transport of spent filters; and
Exhaust Fan maintenance.

[WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110(5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) and (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) and (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

    Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) a) The DOE shall ensure all emission unit components, design, construction, testing and operation

shall be carried out as described in the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002, and WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003. [WAC 246-247-120]

b) Emission unit components design, construction, testing, and operation different from those identified in the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002, and WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002 and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The annual IHLW production from the HLW plant shall not exceed 1.095E3 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110 (10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080(7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges;
-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

40) The differential pressure across each HEPA filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

42) Surface concentrations of smearable contamination for surface areas other than container surfaces within HV-C2 ventilation areas shall not exceed 1,000 dpm/100 cm2 for beta/gamma emitters or 20 dpm/100 cm2 for alpha emitters. [WAC 246-247-110(10,11,12,13)]

43) The USDOE shall perform radiation surveys on at least a quarterly basis of the smearable surface radioactive contamination of exposed surface areas ventilated by emission unit HV-C2. The USDOE shall use the data from these surveys to demonstrate that the annual average surface concentration of beta/gamma emitters does not exceed 1000 dpm/100 cm2 over a surface area of 3630 m2, and that the annual average surface concentration of alpha emitters does not exceed 20 dpm/100 cm2 over a surface area of 3630 m2. [WAC 246-247-110(10,11,12,13)]

44) If electrical power to operate exhaust fans for this emission unit fails, normal operations within this emission unit with the potential to produce particulates shall cease until power is restored. [WAC 246-247-120]

45). Differential pressures shall be monitored between C2 and C3 areas to ensure air flow is from the C2 to C3 areas. [WAC 246-247-120]

46) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. For emission unit HV-C2, periodic confirmatory emissions sampling for particulates shall be performed, with analyses for gross alpha and gross beta/gamma. [WAC 246-247-040(1); WAC 246-247-075]

47) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

48) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

49) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

50) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas associated with this emission unit. [WAC 246-247-120]

51) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

Approval Number: AIR 03-1012 NOC ID: 509

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) HLW VITRIFICATION PLANT

Emission Unit Name: HV-S1 **Emission Unit ID** 554

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements BARCT ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	One stage of HEPA filtration. A total of seven banks of primary HEPAs six in operation and one in standby. Each bank contains six filters.
	Exhaust Fan	2	One in operation and one in standby.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Gross Alpha and Gross Beta/Gamma	Shall be determined prior to cold commissioning

Sampling Requirements: Continuous

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with typographical changes, AIR 03-1012, mailed on October 23, 2003.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

the receipt of high-level waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.

Printed on 22-Oct-03

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit HV-S1 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a single stage of High-Efficiency Particulate Air (HEPA) filtration, and exhaust fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

Space temperatures from which C3 air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The C3V exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:

The exhaust from the C3 ventilation system shall be vented through emission unit HV-S1. The C3 ventilation system shall serve filter plant rooms, exhaust fan rooms, bulger rooms, workshops, maintenance areas, and monitoring areas. Access to a C3 area shall be through a C2/C3 sub-change room. For filter plant rooms, exhaust fan rooms, bulger rooms, workshops, maintenance areas, and monitoring areas ventilated by C3 systems, air will be cascaded from C2 areas, through transfer grilles in the C2/C3 change room, and into the C3 areas.

When a sufficient amount of air cannot be cascaded into a C3 area, a dedicated C2 supply shall be provided with a damper on the C2 supply duct, which shall close in the event of a loss of C3 extract. The C3 exhaust system fans shall be interlocked with the C5 exhaust fans and shall shut down in the

event of a failure of the C5 exhaust system.

An HLW vitrification workshop shall be located in the northeast side of the HLW vitrification plant. The emissions from this area shall be vented through the C3 air ventilation system. Waste management activities performed in this area shall be limited to decontamination, size reduction, and packaging of spent equipment. Equipment shall be transported to the unit contained in bags, shielded casks, or in a standard waste box. In the workshop, the equipment shall be decontaminated to enable "hands on" maintenance. Spent equipment parts shall be bagged and placed in drums or in standard waste boxes for disposal. Size reduction may be performed to facilitate the packaging. Other spent equipment shall be packaged in drums or in standard waste boxes.

The activities which shall be performed in the HLW C3 shop are limited to the following: Exhaust Fan maintenance; booster fan preheater maintenance; cutting, grinding, and welding; hydraulic shearing; master-slave manipulator; valve repair and maintenance; manipulator/equipment storage; auto sampler repair; routine preventative maintenance; breaker preventative maintenance; and switch gear maintenance. Appropriate engineered controls shall be used to cascade emissions from cutting, grinding, welding, and hydraulic shearing directly to the C5 ventilation system. Maintenance within bulges shall be limited to maintenance or repair of pumps and valves. These items shall be flushed or decontaminated prior to removal or repaired in place, if appropriate. Manipulators shall be pulled and transferred to the C3 workshop for decontamination. Once the contamination levels are reduced to within acceptable limits for hands-on maintenance, the manipulator shall be repaired using approved maintenance and radiological procedures. Auto-samplers shall be decontaminated prior to transfer to the C3 workshop. Agitator maintenance shall be performed in-situ.

Certain C3 areas shall not be vented through the C3 ventilation system but shall be cascaded directly into a neighboring C5 area. These specific C3 areas are listed and described in the description of the C5 ventilation system, which is vented by emission unit HV-S2. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110(5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) & (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) and (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

    Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

    Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts,

and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002., and WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003. [WAC 246-247-120]

b) Emission unit components design, construction, testing, and operation different from those identified in the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002, and WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002 and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The annual IHLW production from the IHLW plant shall not exceed 1.095E3 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110(10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997" Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test

facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080(7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges;
-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

40) The differential pressure across each HEPA filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

42) Surface concentrations of smearable contamination for surface areas other than container surfaces within HV-S1 ventilation areas shall not exceed 100,000 dpm/100 cm2 for beta/gamma emitters or

'1000 dpm/100 cm2 for alpha emitters. [WAC 246-247-110(10,11,12,13)]

43) The USDOE shall perform radiation surveys on at least a quarterly basis of the smearable surface radioactive contamination of exposed surface areas ventilated by emission unit HV-S1. The USDOE shall use the data from these surveys to demonstrate that the annual average surface concentration of beta/gamma emitters does not exceed 100,000 dpm/100 cm2 over a surface area of 350 m2, and that the annual average surface concentration of alpha emitters does not exceed 1000 dpm/100 cm2 over a surface area of 350 m2 . [WAC 246-247-110(10,11,12,13)]

44) Alternate power supplied by diesel generators shall be available for the exhaust fans upon loss of normal facility electrical power. [WAC 246-247-120]

45) Differential pressures shall be monitored between C2 and C3 areas to ensure air flow is from the C2 to C3 areas.

Differential pressures shall be monitored between C3 and C5 areas to ensure air flow is from the C3 to C5 areas. [WAC 246-247-120]

46) Interlocks shall be in place to prevent operation of the HV-S1 emission unit upon loss of power to the C5 ventilation. [WAC 246-247-120]

47) Backflow dampers between C3 and C5 ventilation systems must comply with "AMCA Publication 500. Permission to use this standard in this application is based on information submitted to WDOH by the WTP on Dec. 17, 2002. [WAC 246-247-120]

48) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. For emission unit HV-S1, periodic confirmatory emissions sampling for particulates shall be performed, with analyses for gross alpha and gross beta/gamma. [WAC 246-247-040 (1); WAC 246-247-075]

49) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

50) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

51) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

52) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas associated with this emission unit. [WAC 246-247-120]

53) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) HLW VITRIFICATION PLANT

Emission Unit Name: HV-S2 **Emission Unit ID** 555

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT** ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	2	2 stages of HEPAs. A total of 3 sets of 3 banks of primary HEPAs each set has 2 in operation and 1 in standby. Each bank has 5 filters. A total of 3 sets of 3 banks of secondary HEPAs each set has 2 in operation I in standby. Each bank has 5 filters.
	Exhaust Fan	2	One in operation and one in standby.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Radionuclides which contribute 10% of the unabated dose or greater, an unabated dose of 0.1 mrem/yr, and radionuclides that contribute 25% of the abated dose or greater shall be sampled, analyzed/reported. This shall include at a minimum Am-241 and Sr-90.	Continuous

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with typographical changes, AIR 03-1012, mailed on October 23, 2003.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

the receipt of high-level waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit HV-S2 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: two stages of High-Efficiency Particulate Air (HEPA) filtration, and exhaust fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

Space temperatures from which C5 air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The C5V exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:

The exhaust from the C5 ventilation system shall be vented through emission unit HV-S2. The C5 ventilation system shall serve the process areas of the facilities where radioactive waste materials are stored and handled. To help maintain contamination control, the air pressure within C5 areas shall be maintained at levels lower than the pressures of the C2 or the C3 areas.

The areas served by the C5 ventilation system shall receive air via engineered inbleeds designed to cascade a given amount of air necessary to meet design needs. The primary purpose of this cascade ventilation system shall be to enhance control and confinement of radioactive materials provided by the building structural barriers or other process enclosures. The amount of air flow shall also be adequate to ensure removal of ventilated-space heat loads. Confinement shall also be enhanced by maintaining the C5 areas at an air pressure which shall be significantly negative with respect to all other areas. Inbleed systems shall be used at appropriate locations, which shall include personnel access points (C2/C3 subchanges) to C3 areas that cascade to C5 areas, valve and pump bulges, and gloveboxes. The subchange cascade flow from C2/C3 to C3/C5 shall be a minimum of 2100 cfm.

Depending on the type of system served, size of the system, and functional design requirements, inbleed systems shall comprise balancing and isolation dampers (or a valve on smaller systems), and associated ductwork (or piping on smaller systems).

Inbleed systems shall also be used to provide supplementary cooling and fire boundary isolation. When serving these functions, cooling coils, fire dampers, and smoke actuated isolation dampers shall be incorporated in the system. Inbleed systems shall also be used in personnel access points to C3 areas which cascade to C5 areas, valve and pump bulges, and gloveboxes.

To enhance C5 ventilation system reliability and to minimize the possibility for contamination migration to zones of lesser contamination potential due to flow reversals, the C5 exhaust fans shall be provided with a source of backup power. The C5 exhaust fans shall also be interlocked to the exhaust fans serving the C3 and C2 areas of the building. This interlock shall shut down the C3 and C2 exhaust fans upon loss of C5 exhaust fan service. The C3 and C2 exhaust fans shall not start operation without an operating C5 exhaust system. C5 area differential pressures shall be monitored and maintained to established setpoints by a ventilation control system, adjustable fan speed drives, and modulating volume control dampers.

IHLW Canister Decontamination and Monitoring

After filling the cooled IHLW canister shall be decontaminated, swabbed, and monitored prior to transfer to the IHLW canister storage area. The IHLW canister decontamination shall be located in the C5 decontamination/swab and monitor cave. The decontamination target levels for the IHLW product canister shall be 22,000 dpm/100 cm2 for beta and gamma, and 2000 dpm/100 cm2 for alpha-emitting radionuclides.

A filled, cooled, and welded IHLW canister shall be initially washed in a sealed vessel using medium-pressure demineralized water to remove loose contamination. Loose contamination shall be captured in the sealed vessel. The area where the sealed vessel is located shall be served by the C5 ventilation system.

After the demineralized water wash, the canister shall be decontaminated by chemically etching a thin

layer of steel from the canister surface, using cerium ion in a dilute nitric acid solution. The canister shall then be washed with nitric acid, followed by a second washing with demineralized water. The canister shall remain in the sealed vessel to dry, while the decontamination liquids are pumped into a separate decontamination vessel to which hydrogen peroxide shall be added to neutralize remaining cerium ion. Potential emissions from the decontamination fluids in the decontamination vessels shall be treated through the HLW vessel vent treatment system.

After decontamination and drying, the canister shall be swab-sampled using an automated power manipulator and analyzed. If the contamination is below acceptable limits, the IHLW container shall be transferred to the decontamination and swabbing station for further processing.

HLW Melter Cave

The HLW melter cave shall be located in the central portion of the HLW vitrification plant. The emissions from this area shall be vented through the C5 ventilation system.

Activities performed in the melter cave shall be limited to the dismantling and packaging of spent consumables and decontamination. The types of spent consumables shall be limited to waste recirculators, lid heaters, and thermocouples. When spent consumables are ready for change-out, they shall be placed on a consumable storage rack while awaiting size reduction. The consumables shall be reduced in size by dismantling or cutting the spent equipment, or both. This process shall be remotely-conducted on tables in the melter cave. The spent consumables shall be placed in baskets and lowered into containers in a transfer tunnel passing under the HLW melter cave. Airlock cells shall be used for packing or unpacking melters or their components.

In the case of a HLW melter failure, the melter shall be evaluated to ensure that it meets the receiving treatment, storage, and disposal (TSD) facility's waste acceptance criteria, particularly in terms of the radiological contamination in the HLW glass residue present in the melter, before it is placed in an overpack. The overpack shall provide a shielded disposal container for the spent melter. After the outside surfaces of the overpack shall have been checked for radiological contamination and shall have been decontaminated as required, the out-of-service melter shall be moved through the melter airlock and placed on the transporter, to be moved out of the HLW vitrification plant through the rollup doors. Decontamination of the overpack in the airlock, before it is exported, shall be performed manually using moist cloths. Water spray shall also be provided as a contingency.

HLW Vitrification Plant Filter Cave

The HLW filter cave shall contain HEPA filters associated with the C5 ventilation and the melter offgas ventilation systems. The cave shall be located on the 0 ft level.

Within the filter cave, an overhead crane or power manipulator shall be used to change out the HEPA filters, transport in-cave equipment, and handle any tooling necessary to perform maintenance and operational tasks.

Additionally, a dedicated hands-on equipment maintenance area shall be located at the east end of the cave. This area shall be separated from the filter cave by a set of equipment access shield doors. The area shall contain access platforms, decontamination equipment, fixtures and tooling necessary to perform identified maintenance activities and shall also serve as an access route for importing clean

filters into the cave. The overhead crane or power manipulator shall be parked in the maintenance area when not being used in-cave.

Spent HEPA filters shall be size-reduced into a disposal container prior to being exported from the cave. The disposal container shall be lowered through an access hatch in the floor of the cave and into a 55-gallon drum. The drum shall then be lidded, swabbed and assayed prior to being exported from the building.

Radioactive Solid Waste Handling

The HLW vitrification plant drum transfer tunnel shall extend east to west, nearly the entire length of the HLW vitrification plant. The emissions from this area shall be vented through the C5 ventilation system.

At both the filter cave and the melter cave, drums shall be positioned under the filter cave/melter cave export well and the drum transfer cart shall be locked into position. The containment between the filter cave/melter cave and the drum transfer tunnel shall be maintained by an engineered air-gap between the top of the drum and the underside of the export well. A loaded basket shall then be lowered into the drum, using the filter cave/melter cave handling equipment. The drum shall then be lowered and transferred to the drum lidding station, where the outer lid shall be replaced and crimped onto the drum.

Prior to transporting to the central waste storage area, the sealed drums shall be swabbed for contamination along their bottom, sides, and lid interface. Viewing windows shall be positioned to allow for the evaluation of the swabbing process. The swabs shall be monitored for radiological contamination in an external glovebox. If surface contamination exceeds the accepted limits, the drum shall be repeatedly vacuum-cleaned, swabbed, and washed with wet swabs until the radiological limits have been met. Drums shall be transported by means of an overhead bridge crane and drum grapple. The drums shall be lowered through the swabbing and monitoring system floor hatch into an open transport cask. The cask lid shall be replaced and the cask shall be monitored for gamma radiation shine paths before it is transferred to the import/export area by means of the cask transfer cart. The cask shall then be transferred to the truck bay by an overhead crane for shipment to the central waste storage area.

HLW Vitrification Plant In Cell Maintenance

HLW vitrification plant cells shall contain the melter, melter feed preparation and feed vessels, and certain offgas system components. Overhead cranes, hoists, master-slave and power manipulators shall be the primary equipment used to carry out various replacement, size reduction and packaging tasks. Auxiliary tools shall be limited to impact wrenches, nut-runners, and hydraulic shears. The emissions from these areas shall be vented through the C5 ventilation system.

Maintenance activities shall be limited to dismantling and size reduction of spent melter components or consumables for export out of the cave in waste containers. Various size reduction tools shall be used to cut down the equipment. The waste shall be placed on a sorting table for screening and segregation prior to packaging and export.

Melter replacement shall generally be preceded by an alternate glass removal step. Lid heaters shall keep the glass pool at the desired temperature ranges. Air and vacuum lines shall be inserted to draw

the molten glass into an attached canister. The failed melter shall be disconnected and prepared for transport out of the cave.

A consumable bucket, equipped with interchangeable lid cutouts called templates, shall be used to import and export melter consumables. HLW melter feed process system vessels shall be organized such that power manipulators can disconnect connections and prepare failed vessels and components for export. Components of the HLW melter offgas system found in this cave shall also be organized for similar activities.

A crane decontamination area above the C3/C5 airlock shall also be used for the decontamination of equipment before hands-on maintenance in the crane maintenance area. In the decontamination room, the crane and equipment shall be decontaminated with a demineralized high pressure wash water spray. Non-organic detergents or acid solvents shall also be used, if needed. Wash water shall be collected by a sump. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110(5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) and (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) and (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of

Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

    Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002. [WAC 246-247-120]

b) Emission unit components design, construction, testing, and operation different from those identified in the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The annual IHLW production from the HLW plant shall not exceed 1.095E3 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110(10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080(7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges;
-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

40) The differential pressure across each HEPA filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

42) The USDOE shall submit calculations to WDOH for approval which demonstrate that IHLW containers which have been filled with molten glass but not yet sealed shall not emit radioactive gases or particulates. [WAC 246-247-120]

43) Alternate power supplied by diesel generators shall be available for the exhaust fans upon loss of normal facility electrical power. [WAC 246-247-120]

44) Differential pressures shall be monitored between C3 and C5 areas to ensure air flow is from the C3 to C5 areas. [WAC 246-247-120]

45) Interlocks shall be in place to prevent operation of the HV-S1 emission unit upon loss of power to the C5 ventilation. [WAC 246-247-120]

46) Backflow dampers between C3 and C5 ventilation systems must comply with "AMCA Publication 500. Permission to use this standard in this application is based on information submitted to WDOH by the WTP on Dec. 17, 2002. [WAC 246-247-120]

47) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. Emission unit HV-S2 shall be continuously monitored. Radionuclides which contribute 10% of the

unabated dose or greater, produce a unabated dose of 0.1mrem/yr, and radionuclides that contribute 25% of the abated dose or greater shall be sampled, analyzed, and reported. This shall include at a minimum Am-241 and Sr-90.

Prior to hot commissioning, a procedure to manage down time or failure time of continuous sampling and monitoring equipment will be developed, and documentation describing this procedure shall be submitted to WDOH for review and approval. [WAC 246-247-040(1); WAC 246-247-075]

48) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

49) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

50) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

51) Volume reduction equipment ("HEPA Compactors") shall not be operated within the area ventilated by this emission unit until a demonstration, showing the current emission estimate from this emission unit bounds the emissions from the operation of the HEPA compactors, is presented to WDOH for review and approval. Cold testing is authorized. [WAC 246-247-120]

52) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

Approval Number: AIR 03-1012 NOC ID: 509

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) HLW VITRIFICATION PLANT

Emission Unit Name: HV-S3B **Emission Unit ID** 753

This is a MAJOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: None

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	Film Cooler	1	One in operation.
	Submerged Bed Scrubber	1	One in operation.
	Wet Electrostatic Precipitator	1	One in operation.
	Injection Air	1	Operational.
	High Efficiency Mist Eliminator	2	One in operation and one in standby.
	Heater	2	One in operation and one in standby.
	HEPA	2	Two stages of HEPA filtration. A total of two banks of primary HEPAs one in operation and one in standby. Each bank contains two filters. A total two banks of secondary HEPAs one in operation and one in standby. Each bank contains two filters.
	Heat Exchanger	1	One in operation.
	Booster Fan	3	Two in operation and one in standby.
	Heat Exchanger	1	One in operation
	Silver Mordenite Adsorber	1	One in operation.
	Fan	3	Two in operation and one in standby

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Am-241, Cm-243, Cm-244, Cs-137, Eu-152, Eu-154, Eu-155, I-129, Np-237, Pu-238, Pu-239, Pu-240, Pu-241, Sb-125, Sm-151, Sr-90, Tc-99, U-233, U-234, Y-90, Ru-106, Cs-134, Ra-226, U-232, Pa-	Continuous

Printed on 22-Oct-03

231, AC-227, Am-243, H-3,
Sn-126, Cm-242.

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with typographical changes, AIR 03-1012, mailed on October 23, 2003.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

the receipt of high-level waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit HV-S3b, as described in ORP letter number 02-ED-045 dated Jan. 10, 2003, "Supplemental Information Supporting the Hanford Tank Waste Treatment and Immobilization Plant (WTP) Radioactive Air Emissions Notice of Construction (NOC)," is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a film cooler, a Submerged Bed Scrubber (SBS), a Wet Electrostatic Precipitator (WESP), an injection of air delivered through a Vessel Vent Header , a High Efficiency Mist Eliminator (HEME), a Heater, two stages of High-Efficiency Particulate Air (HEPA) filtration in series, a Heat Exchanger, a Booster Fan, a 2nd Heat Exchanger, a Silver Mordenite Bed, routed back through the 1st Heat Exchanger, and Exhaust Fans. Control technologies for operation of the emission unit that are not regulated by this license (located between the 2nd Heat Exchanger and the Silver Mordenite Bed) are a Heater, a Thermal Catalytic Oxidizer, a Selective Catalytic Reduction unit, and routed back through the 2nd Heat Exchanger.

The maximum differential pressure across each filter HEPA bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

The inlet airstream temperatures for each HEPA filter bank shall be measured by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The temperature differential shall be controlled to ensure Relative Humidity (RH) is within acceptable limits. The moisture content of the inlet airstream for each HEPA filter bank shall be measured by a capacitive moisture sensor that is specified to be tolerant of particulate contamination and most chemicals. The dewpoint of offgas air flow shall be measured and subsequently controlled by temperature to ensure that the air stream is above its dewpoint in order to prevent condensation in offgas treatment equipment such as HEPA filters. The various component selections for moisture sensor instruments shall be based on factors that include range, accuracy, offgas stream constituents, and radiation levels.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:

The emission source to emission unit HV-S3 shall consist of off-gases from the HLW melter and process vessels.

HLW Melter Feed System (C5)

Treated HLW feed shall be analyzed to determine the glass additive formulation for the conversion of the waste to glass. The glass additives specified in the formulation shall be weighed and blended in the HLW glass former feed system, and subsequently mixed with the treated HLW waste. The HLW glass former feed system shall have no potential to emit radioactive air emissions. The HLW melter feed shall comprise the mixture of glass formers and treated HLW waste.

The HLW melter feed shall be transferred to each melter with air displacement slurry pumps. The pumps shall transfer the slurry from the feed vessel to the melter utilizing air as the motive force. The melter feed nozzles shall be installed in the melter lid for introduction of slurry over the melt pool cold cap. Each feed nozzle shall be individually supplied from a separate pump to reduce the likelihood of line plugging. The feed nozzles shall be insulated with ceramics to prevent drying the feed before it reaches the melter. Water flushes shall be used to clear the feed lines as necessary.

The feed rate to the melter pool shall be determined based on the average plenum temperature in the melter. The plenum temperatures shall be controlled in the range of between 400 °C and 500 °C (752 °F and 932 °F). The plenum thermocouples shall be used to monitor plenum temperature and change the rate of feeding to the melter.

HLW Melter (C5)

The single HLW melter shall have a single internal glass chamber with a rectangular surface area. The melter shall be lined with refractory material designed to withstand corrosion by molten glass. The energy for the melt shall be delivered by three sets of electrodes mounted on opposite walls of the glass

pool. The nominal melter glass pool temperature is 950 °C to 1250 °C (1742 °F to 2282 °F). The glass shall be discharged through either of two discharge chambers located within one of the long axis walls of the melter. The steel casing for the melter area shall be provided with water cooling to maintain a thermal gradient in the bricks for corrosion control, prevent migration of glass through the bricks, and reduce heat load to the process cell. The lid of the HLW melter shall be sealed to the melter shell in order to provide gas containment. The lid shall provide a support structure through which sub-components can be mounted for submersion in the melt pool and suspension in the melter plenum. Penetrations, primarily on the lid, through the outer shell are sealed by appropriate fittings that allow remote removal and replacement. The HLW melter shall be remotely operated and maintained.

Melter Containment System

The refractory shall be part of the melter containment and consists of two separate sections. One section shall be the refractory in contact with the molten glass pool, and the other refractory section shall surround the gas space above the glass pool, which is commonly referred to as the plenum. The glass pool refractory, in conjunction with active cooling provided by a water jacket, shall provide glass containment, thermal insulation, and electrical isolation. A steep temperature gradient through the refractory shall be established to 'freeze' glass mid-way within the refractory wall. The refractory shall be held under compression with special bolts so that no gaps exist in the joints to allow molten glass penetration. The plenum refractory shall be primarily designed to resist thermal shock, resist corrosion by offgases, and to resist corrosion by splashed feed and glass. Two refractory thermowells shall monitor the condition of the melter structure. The thermowells shall be located at a joint between the two refractory layers. The containment shells shall be designed to prevent glass leaks in the unlikely event of refractory failure.

Materials within the HLW vitrification plant shall be selected to prevent corrosion. For example, to prevent corrosion from acidic solutions within the SBS and the associated condensate vessels, these vessels shall be constructed of Hastelloy C-22. The SBS waste collection vessel shall be constructed of a 6 % molybdenum alloy, and the associated cooling jackets shall be constructed of 304L stainless steel. The WESP and the HEME, which are downstream from the SBS system, shall also be constructed of a 6 % molybdenum alloy. 316L stainless steel shall be used for the construction of all components downstream from the WESP or the HEME. The melter shell shall consist of the lid and base plate, as well as the structure needed to support the lid.

The melter shell shall be designed to allow operation of the melter at a negative pressure with air in-leakage from the melter cave. The pressure differential between the melter cave and the inside of the melter shall be maintained so as to create the air in-leakage to reduce the deposition of corrosive materials such as sodium borate and lithium borate, to the spaces between the gas barrier and the refractory.

The HLW melter shall be operated under a cascaded ventilation system. The melter plenum shall be maintained at a vacuum with offgas system blowers and controlled injection of air into the offgas line near the melter exhaust. The flowrate of the injection air shall be automatically controlled, based on melter plenum pressure, so that a relatively constant melter pressure shall be maintained although the melter offgas generation rate fluctuates. This shall ensure containment and avoid pressurization.

The melter shell shall have a drain located in the base-plate between the shell and the glass pool

refractory. The drain shall prevent the backup of water in the event of a cooling water leak or the uncontrolled addition of water from other sources. The drain shall have a sealing mechanism to prevent the inward flow of air due to melter vacuum and a leak detection system.

Joule Heating

The heat for the HLW melter startup shall be provided by temporarily installed radiant electric heaters mounted through the lid of the melter. These heaters shall melt the starter charge of frit sufficiently to make it conductive between the melter's Joule-heating electrodes. When a conducting path is established, the melter shall be heated in a controlled manner by passing more and more current between the electrodes through the glass (a process known as Joule-heating). Slurry feeding shall start when the melter reaches its operating temperature.

No radioactive air emissions shall be generated when the radiant heaters are removed after initial startup because the process fluid is not radioactive. Removal of the heater from the melter shall be performed with an air sweep into the melter to prevent significant releases of contaminants. The air sweep shall be drawn into the offgas system.

The Joule-heating system shall comprise the melter electrodes, electrode power supplies, melter glass pool thermocouples, and the electrode control system.

The electrode configuration for each HLW melter shall consist of three plate electrodes, two mounted on opposite sides of the melter and one on the bottom. The electrodes shall be cooled by forced air and have forced-air cooled electrode extensions. The extensions shall penetrate the side of the melter below the glass level to minimize the effects of thermal expansion and to minimize the potential for sulfate corrosion. Active cooling of the extensions and the use of a water-cooling jacket shall prevent glass from migrating through the refractory package adjacent to the electrode extension penetrations. Power to the electrodes shall be single-phase alternating current applied across opposing electrodes. The nominal glass melt pool temperature shall be between 950 °C and 1250 °C (1742 °F and 2282 °F). This shall be measured with thermocouples in thermowells submerged into the pool at various locations. The power to the electrodes shall be regulated to maintain the temperature at the nominal value.

Glass Discharge System

The HLW melter shall have two identical and independently operated glass discharge systems located adjacent to each other on a long side of the melter. The glass discharge systems shall include the melter glass level detectors, canister glass level detection, riser, airlift lance, trough, and a heated discharge chamber.

The glass discharge from the melter shall be initiated by injecting air or an inert gas at the bottom of the airlift riser. As the gas bubbles rise in the glass, they shall entrain glass in the riser to the inlet of the trough. The glass shall then flow into the waste canister. The rate of glass discharge shall be controlled by adjusting the rate at which the air and gas mixture is injected into the bottom of the riser.

The starting and stopping of the glass discharge shall be based on the level of glass in the melter. The glass level in the melt pool shall be maintained to within an approximate 1-in. band to reduce thermal stresses on the refractory. Glass discharge operations shall be monitored using a camera system to

- observe the glass pour stream. The level in the waste canister shall also be monitored via infrared thermal imaging and gamma level detectors to prevent overfilling.

HLW Canister Handling System

The pour tunnels shall be located south of the melter caves and shall extend in the north-south direction. A cart and rail system shall extend further under the melter cave, allowing a standby cart to be positioned under the melter when the process cart is in the pour position. The rails shall be isolated from the melter cave with steel contamination control barriers. The cart decontamination areas shall be located south of the melter caves and north of the pour tunnel cart maintenance room.

When a canister is required for filling of the IHLW, it shall be taken out of the buffer rack in the canister handling cave using the canister handling cave crane and transferred above the appropriate pour tunnel hatch. The hatch shall be opened and the canister handling cave crane will load the empty canister into the pour tunnel cart. The grapple shall be released and raised, and the hatch shall be closed. The cart shall travel north to the lidding device. At the lidding device, the primary cart shall move up to the standby cart and latch onto it. The primary cart shall then be in position with the lid removed. The standby cart shall be shunted along the track until the primary cart is in position under the pour spout. The primary cart shall then be in position, the pour spout shall be lowered onto the canister flange, and the canister shall be filled with IHLW.

After completion of filling, the canister shall remain at the pour spout for approximately 1 hour to allow a "skin" to form over the glass, which shall provide a seal to prevent additional off-gassing. The pour spout shall then be retracted, and the primary cart shall be unlocked and moved back. This sequence shall also move the standby cart back under the pour spout. The filled canister shall be allowed to cool prior to removal from the pour tunnel. The primary cart shall then be unlatched from the standby cart and moved south in the pour tunnel until it is beneath the canister handling cave hatch. The hatch shall be opened, the canister handling cave crane shall remove the full canister, and the hatch shall be closed. The filled canister shall then be cooled in cooling racks in preparation for welding the lid in place. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all

applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110(5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) and (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) and (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

    Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

    Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event

the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) (a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002. [WAC 246-247-120]

(b) Emission unit components design, construction, testing, and operation different from those identified in the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

(c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

(d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the Washington State Department of Health Code Compliance Matrix for the Waste Treatment Plant Process Gas Treatment systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, valves, piping, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The annual HLW production from the HLW plant shall not exceed 1.095E3 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110(10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080(7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges;
-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The USDOE shall provide manufacturer's specifications and/or research and development data, including published removal efficiencies and installation requirements, to demonstrate to WDOH that the Submerged Bed Scrubber (SBS), Wet Electrostatic Precipitator (WESP), High Efficiency Mist Eliminator (HEME), and Silver Mordenite Bed in this emission control unit are intended to operate at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. This information shall be provided to the WDOH at least 90 days prior to hot commissioning.

Where actual measurements are impossible, the USDOE shall provide to the WDOH for approval prior to hot startup sufficient information to demonstrate that the control equipment has been installed in accordance with manufacturers' specifications and that the manufacturers' specifications shall achieve design removal efficiencies. Where the application depends on research and development data, the

USDOE shall provide to the WDOH for approval prior to hot startup sufficient information to demonstrate that the control equipment has been installed in a manner consistent with the conditions under which the research and development data was obtained. [WAC 246-247-120]

40) The differential pressure across each HEPA filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

41) If temperatures of air entering the HEPA filters exceed the manufacturer's recommendations for the filters, WDOH shall be notified and the cause of the temperature excursion shall be determined. HEPA filters shall be evaluated for the need to be replaced. [WAC 246-247-120]

42) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

43) The USDOE shall notify the WDOH before initiating use of the maintenance ventilation bypass line for the Submerged Bed Scrubber (SBS) and the Wet Electrostatic Precipitator (WESP). Prior to initiating use of the maintenance ventilation bypass line for the SBS and the WESP, waste feed to the HLW Melter shall be halted, and the melter shall be placed into an idle condition. All emissions control system components for emission unit HV-S3 shall remain online for sufficient time after initiation of melter idling to allow the cold cap to burn off. While the SBS/WESP maintenance bypass line is in use, offgas shall be treated with all other emission control systems for emission unit HV-S3, including the HEME, HEPA filtration, and Silver Mordenite Bed. Temperature of the offgas air stream leaving the HLW melter shall be sufficiently low (less than 400 oC) to ensure that cesium-137 and technetium-99 are in aerosol form and are captured by the HEPA filters.

Prior to hot commissioning, appropriate procedures to initiate this by-pass system shall be established, and documentation describing these procedures shall be provided to WDOH for review and approval. [WAC 246-247-120]

44) The differential pressure across the SBS shall be monitored, recorded, and trended. Prior to hot commissioning, parameters appropriate for measuring the performance of the SBS and operating ranges for these parameters shall be established and presented to WDOH for approval. [WAC 246-247-120]

45) Alternate power supplied by diesel generators shall be available for the exhaust fans upon loss of normal facility electrical power. [WAC 246-247-120]

46) The WDOH shall be notified prior to installation of the mechanical reamer for the HLW film cooler. [WAC 246-247-120]

47) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002.

Emission unit HV-S3 shall be continuously monitored. Radionuclides which contribute 10% of the unabated dose or greater, or produce an unabated dose of 0.1mrem/yr, and radionuclides that contribute 25% of the abated dose or greater shall be sampled, analyzed, and reported. The HV-S3 emission unit

sampling system shall be designed to analyze at a minimum the following radionuclides: Am-241, C-14, Co-60, Cm-243, Cm-244, Cs-137, Eu 152, Eu-154, Eu-155, I-129, Np-237, Pu-238, Pu-239, Pu-240, Pu-241, Sb-125, Sm-151, Sr-90, Tc-99, Th-232, U-233, U-234, Y-90, Ru-106,Cs-134, Ra-226, U-232, Pa-231, Ac-227, and Am-243.Prior to hot commissioning, a procedure to manage down time or failure time of continuous sampling and monitoring equipment shall be developed, and documentation describing this procedure shall be submitted to WDOH for review and approval. [WAC 246-247-040(1); WAC 246-247-075]

48) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

49) A new air sampling station shall be established at a distance of approximately 1500 meters in the ESE direction from WTP. This sampling station is hereinafter called the "New Station".

50) The following ambient air sampling stations shall be operated as a monitoring network, with all sampling, analysis, interpretation, and reporting to managed as a single entity: a) the New Station, b) Vit Plant North, c) B Pond, d) 200 ESE, e) N-977, f) N-985, g) N-158, h) N-984, i) N-498, j) N-499, k) West End Fir Road.

51) At all 11 of these stations the following air sampling regime shall be conducted: a) gross alpha/gross beta samples shall be collected on a bi-weekly basis (particulate air filters operated for two-week periods); b) particulate air samples shall be composited on a monthly basis and analyzed by gamma scan for the following radionuclides: Ru-106, Sb-125, Cs-134, Cs-137, Eu-154, and Am-241, plus any other radionuclides with positive activities greater than the MDA; and c) particulate air samples shall be composited on a quarterly basis and analyzed with appropriate radiochemical methods for Sr-90 and Pu-239-240.

52) At the New Station, the Station at 200 ESE, and the Station at the West End of Fir Road, the following additional air samples shall be collected: a) tritium samples shall be obtained with silica gel or molecular sieve filters, collected approximately monthly, and the extracted moisture shall be analyzed by liquid scintillation; b) continuous air samples shall be collected on a monthly basis with appropriate sample media and analyzed with appropriate radiochemical techniques for C-14; and c) continuous air samples shall be collected with appropriate media and combined on a quarterly basis to be analyzed with appropriate radiochemical techniques for I-129.

53) Sampling and sample analysis regimes used for WTP ambient air monitoring shall meet or exceed the following minimum detectable concentrations over the above specified sampling periods:

ANALYSIS	Minimum Detectable Concentration
Gross Alpha:	0.001 pCi/m3
Gross Beta:	0.003 pCi/m3
Tritium:	3 pCi/m3
Strontium-90 :	0.0001 pCi/m3
Iodine-129:	0.00001 pCi/m3
Gamma Scan (137Cs) :	0.01 pCi/m3
Pu Isotopic :	0.000005 pCi/m3
Americium-241:	0.00005 pCi/m3

54) Preoperational monitoring shall be performed to obtain a baseline of all analytes prior to commencement of processing of radioactive waste at the WTP. A baseline dataset of 12 contiguous months of validated data shall be provided to WDOH for review and approval.

55) The operational status of the data management system for collecting, validating, and evaluating WTP ambient monitoring data shall be demonstrated to WDOH by providing in report form the baseline dataset of 12 contiguous months of validated data of all analytes for review and approval.

56) Validated gross beta sample results from all 10 stations shall be reported within 30 days of sample collection, and all data shall be promptly analyzed for trends.

57) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

58) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

59) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas associated with this emission unit. [WAC 246-247-120]

60) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

61) The USDOE shall notify the WDOH before initiating replacement of a melter unit in the HLW. Prior to initiating replacement of the melter unit, waste feed to the HLW Melter shall be halted, and the melter shall be placed into an idle condition. All emissions control system components for emission unit HV-S3 shall remain online for a minimum period of time after initiation of melter idling to allow the cold cap to burn off. Prior to hot commissioning, appropriate procedures to initiate replacement of a failed melter shall be established and submitted to WDOH for review and approval. [WAC 246-247-120]

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) HLW VITRIFICATION PLANT

Emission Unit Name: IHLW-S1 **Emission Unit ID 754**

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT** ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	One stage of HEPA filtration. A total of three banks of primary HEPAs two in operation and one in standby. Each bank contains four filters.
	Exhaust Fan	2	Both active

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Gross Alpha and Gross Beta/Gamma	Shall be determined prior to cold commissioning

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with typographical changes, AIR 03-1012, mailed on October 23, 2003.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

the receipt of high-level waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit IHLW-S1 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a single stage of High-Efficiency Particulate Air (HEPA) filtration, and exhaust fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

Space temperatures from which C3 air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The C3V exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:

The emissions from IHLW canister storage area shall be vented through emission unit IHLW-S1.

After lidding and decontamination, the immobilized HLW (IHLW) canisters shall be swabbed and surveyed for loose surface contamination prior to transport to the IHLW canister storage area. The IHLW canisters shall remain in storage until they can be shipped to the disposal location. The IHLW shall be considered sealed sources. The emissions from residual surface contamination on the IHLW canisters shall be vented to emission unit IHLW-S1. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow

operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110(5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) and (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) and (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to

- the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002, and WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003. [WAC 246-247-120]

b) Emission unit components design, construction, testing, and operation different from those identified in the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002, and WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the WDOH Code Compliance Matrix for HLW HVAC Systems, 24590-HLW-RPT-ENG-02-003, Rev A, dated November 15, 2002 and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The annual IHLW production from the HLW plant shall not exceed 1.095E3 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110(10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080 (7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges;
-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the

WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

40) The differential pressure across each HEPA filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

42) The USDOE shall perform radiation surveys on canister surfaces prior to storage in areas ventilated by IHLW-S1. The USDOE shall use the data from these surveys to demonstrate that the annual average surface concentration of beta/gamma emitters does not exceed 22000 dpm/100 cm2 over exposed surfaces other than containers, and that the annual average surface concentration of alpha emitters does not exceed 2000 dpm/100 cm2 over exposed surfaces other than containers. [WAC 246-247-110(10,11,12,13)]

43) Alternate power supplied by diesel generators shall be available for the exhaust fans upon loss of normal facility electrical power. [WAC 246-247-120]

44) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. For emission unit IHLW-S1, periodic confirmatory emissions sampling for particulates shall be performed, with analyses for gross alpha and gross beta/gamma. [WAC 246-247-040(1); WAC 246-247-075]

45) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

46) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

47) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

48) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas associated with this emission unit. [WAC 246-247-120]

49) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) LABORATORY

Emission Unit Name: LB-C2 **Emission Unit ID** 557

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	One stage of HEPA filtration. A total of ten banks of primary HEPAs nine in operation and one in standby. Each bank contains four filters.
	Exhaust Fan	2	Two in operation.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Gross Alpha and Gross Beta/Gamma	Shall be determined prior to cold commissioning

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes, AIR 03-1013, mailed on October 23, 2003.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**
the receipt, preparation and analysis of radioactive samples from the Pretreatment, LAW, and HLW production facilities. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit LB-C2 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a single stage of High-Efficiency Particulate Air (HEPA) filtration, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass. Impulse lines shall be stainless steel.

Space temperatures from which C2 air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The C2V exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:

The building ventilation air associated with general laboratory work areas and offices shall be vented through emission unit LB-C2. LB-C2 general laboratory work areas and offices shall be maintained at radiological levels such that they may be accessed by personnel in street clothes with no requirement for personal protective equipment. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI

doses for all WTP emission units and submit this information to WDOH.

A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110(5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) & (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) and (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction

or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or

completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) (a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for LAB HVAC Systems, 24590-LAB-RPT-ENG-02-001, Rev A, dated November 15, 2002. [WAC 246-247-120]

(b) Emission unit components design, construction, testing, and operation different from those identified in the WDOH Code Compliance Matrix for LAB HVAC Systems, 24590-LAB-RPT-ENG-02-001, Rev A, dated November 15, 2002 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

(c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

(d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the applicable standards the WDOH Code Compliance Matrix for LAB HVAC Systems,24590-LAB-RPT-ENG-02-001, Rev A, dated November 15, 2002 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2);

WAC 246-247-120; 40 CFR Part 61.93]

32) The total number of samples received annually in the analytical laboratory shall not exceed 6000 samples with an average sample volume not exceeding 15 ml. [WAC 246-247-030(5); WAC 246-47-110 (10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080(7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges;
-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

40) The differential pressure across each HEPA filter bank shall be monitored, recorded, and trended.

Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH for approval. [WAC 246-247-120]

41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

42) If electrical power to operate exhaust fans for this emission unit fails, normal operations within this emission unit with the potential to produce particulates shall cease until power is restored. [WAC 246-247-120]

43) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. For emission unit LB-C2, periodic confirmatory emissions sampling for particulates shall be performed, with analyses for gross alpha and gross beta/gamma. [WAC 246-247-040(1); WAC 246-247-075]

44) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

45) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

46) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

47) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) LABORATORY

Emission Unit Name: LB-S1 **Emission Unit ID** 558

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT** ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	One stage of HEPA filtration. A total of 16 banks of primary HEPAs 14 in operation and 2 in standby. Each bank contains 4 filters.
	Exhaust Fan	3	Two in operation and one in standby.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Gross Alpha and Gross Beta/Gamma	Shall be determined prior to cold commissioning

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes, AIR 03-1013, mailed on October 23, 2003.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

the receipt, preparation and analysis of radioactive samples from the Pretreatment, LAW, and HLW production facilities. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit LB-S1 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a single stage of High-Efficiency Particulate Air (HEPA) filtration, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass. Impulse lines shall be stainless steel.

Space temperatures from which C3 air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The C3V exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:

Sample Receipt from the Pneumatic Transport System

Containerized samples transported pneumatically shall be received in the lab marshalling room. The marshalling room shall consist of several cubicles housing the equipment necessary to:

-Store sample bottles and carriers
-Send sample bottles (in carriers) to the pretreatment, HLW vitrification and LAW vitrification plants
-Separate samples from their respective carrier
-Identify each sample and measure the associated radioactivity
-Send samples with high radioactivity (greater than 0.01 Ci) to the receipt cell (analytical hot cell series) and send samples with low radioactivity (less than 0.01 Ci) to the receipt lab (rad labs)
-Decontaminate sample carriers

The emissions from this activity shall be vented through emission unit LB-S1.

Radiological Laboratories (Rad Labs)

The radiological laboratories (rad labs) shall be designed to support the preparation and analysis of moderately radioactive samples from each of the production facilities. The rad labs shall also supplement the analytical capabilities of the analytical hot cell series and support technology development and diagnostics, using materials that have very low or no radioactivity. The rad labs shall be capable of receiving sample aliquots from the hot cells via pneumatic transport or samples transported manually from the production facilities or from the hot cells.

Specifically, the rad labs shall include the facilities and equipment required to support the following activities:

-Total organic and inorganic analyses
-Quantitation of metals and anions
-Organic quantitation
-Radionuclide counting
-Sample receipt and (manual) transport
-X-ray spectrometry and X-ray diffraction analysis
-Scanning electron microscopy (SEM)
-Testing of glass coupons (e.g., toxicity characteristic leaching procedure [TCLP])
-Preparation of glass samples for elemental analysis
-General physical properties analysis

Laboratory Maintenance

The analytical laboratory maintenance shop shall provide space for performing preventive and corrective maintenance on laboratory equipment. The analytical laboratory maintenance shop shall comprise two shops, each in a separate potential radioactivity contamination area. The activities performed in the analytical laboratory maintenance shop shall consist of decontamination, maintenance, and storage of contaminated equipment such as hot cell manipulators. The C3 shop shall also contain compaction equipment for the reduction of solid waste generated in the rad lab. The activity performed in the C2 shop shall consist of the maintenance of equipment not expected to be radioactively contaminated such as electrical components, utilities systems components, and instruments. The following maintenance activities shall be performed in the laboratory workshop:

-Manipulator repair. Manipulators shall be pulled and transferred to the C3 workshop for decontamination. After contamination levels are reduced to within acceptable limits for hands-on maintenance, the manipulator shall be repaired using approved maintenance and radiological procedures.
-Valve Maintenance.
-Pump Maintenance.
-Exhaust Fan Maintenance.

[WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow

operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

   A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110(5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) and (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040 (3) and (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

    Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to

the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) (a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for LAB HVAC Systems,24590-LAB-RPT-ENG-02-001, Rev A, dated November 15, 2002. [WAC 246-247-120]

(b) Emission unit components design, construction, testing, and operation different from those identified in the WDOH Code Compliance Matrix for LAB HVAC Systems, 24590-LAB-RPT-ENG-02-001, Rev A, dated November 15, 2002 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

(c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

(d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the applicable standards the WDOH Code Compliance Matrix for LAB HVAC Systems,24590-LAB-RPT-ENG-02-001, Rev A, dated November 15, 2002 shall be made available for

review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The total number of samples received annually in the analytical laboratory shall not exceed 6000 samples with an average sample volume not exceeding 15 ml. [WAC 246-247-030(5); WAC 246-47-110(10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080(7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges;
-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the

"Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

40) The differential pressure across each HEPA filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH approval. [WAC 246-247-120]

41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

42) If electrical power to operate exhaust fans for this emission unit fails, normal operations within this emission unit with the potential to produce particulates shall cease until power is restored. [WAC 246-247-120]

43) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. For emission unit LB-S1, periodic confirmatory emissions sampling for particulates shall be performed, with analyses for gross alpha and gross beta/gamma. [WAC 246-247-040(1); WAC 246-247-075]

44) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

45) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

46) WTP shall identify maintenance activities that will require localized controls for particulates. Such activities shall include, at a minimum, the C3 shop compaction equipment for the reduction of solid waste generated in the radioactive materials laboratory. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) LABORATORY

Emission Unit Name: LB-S2 **Emission Unit ID** 559

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	2	Two stages of HEPA filtration. A total of eight banks of primary HEPAs six in operation and two in standby. Each bank contains four filters. A total eight banks of secondary HEPAs six in operation and two in standby. Each bank contains four filters.
	Exhaust Fan	2	One in operation and one in standy

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Radionuclides which contribute 10% of the unabated dose or greater, produce an unabated dose of 0.1 mrem/yr, and radionuclides that contribute 25% of the abated dose or greater. At a minimum analyses for gross alpha and gross beta/gamma.	Continuous

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes. AIR 03-1013, mailed on October 23, 2003.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

the receipt, preparation and analysis of radioactive samples from the Pretreatment, LAW, and HLW production facilities. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit LB-S2 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: two stages of High-Efficiency Particulate Air (HEPA) filtration in series, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass. Impulse lines shall be stainless steel.

Space temperatures from which CS air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The CSV exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:

Operation of hot cells as described below:

Analytical Hot Cell Series

The analytical hot cell series shall be designed to provide sample preparation and analyses required to support production at the pretreatment and HLW vitrification facilities. This series of hot cells shall be capable of accepting samples taken automatically from each of the production facilities (using pneumatic transport). The analytical hot cell series shall also be capable of accepting samples transported manually. Some of these samples shall be transported to the technology hot cell series or to the rad labs either directly or after dilution, or after stripping of the radioactive content.

Specifically, the analytical hot cell series shall include facilities and equipment required to perform the following activities:

-Sample receipt and transport
-Dilution, fusion, and dissolution required to prepare samples for subsequent analysis
-Extraction for organic analyses
-Total organic and inorganic carbon analyses
-Metal and anion quantitation
-Waste collection and transport

Technology Hot Cell Series

The technology hot cell series shall be designed to support process technology development and diagnostics. This series of hot cells shall be capable of accepting samples transported by trolley from the receipt cell in the analytical hot cell series.

Specifically, the technology hot cell series shall include the facilities and equipment required to support the following activities:

-Preparation of samples for lab-scale vitrification
-Vitrification of prepared samples
-Testing of glass coupons (e.g., toxicity characteristic leaching procedure [TCLP] and product consistency test [PCT])
-Ultrafilter technology diagnostics
-Ion-exchange media diagnostics
-Evaporator operational support and diagnostics
-Preparation of glass samples for elemental analysis
-General physical properties analysis

Laboratory Waste Management

Small volumes of solid waste shall be accumulated in the hot cells until the quantity is sufficient to fill a 55 gallon drum. Wastes shall be transferred into 55-gallons drums using a bagless transfer system. Waste from the hot cells shall then be transferred to the waste accumulation area where waste management, and waste treatment activities shall be conducted. Ventilation flow from the waste accumulation area shall be routed to the C5 HEPA filtration system.

Aqueous radioactive liquid collected from the laboratory C5 storage tanks shall be transferred to the pretreatment plant for processing. Solid and organic liquid wastes shall be packaged and transferred to a on-site waste storage plant awaiting final disposition. [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH.

   A minimum of one year prior to the receipt of waste material the licensee shall certify that the recalculated radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units are still appropriate or recalculate and resubmit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110(5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) and (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) and (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

    Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing. [(WAC 246-247-075(9) and (10)]

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95: WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) (a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for LAB HVAC Systems, 24590-LAB-RPT-ENG-02-001, Rev A, dated November 15, 2002. [WAC 246-247-120]

(b) Emission unit components design, construction, testing, and operation different from those identified in the WDOH Code Compliance Matrix for LAB HVAC Systems, 24590-LAB-RPT-ENG-02-001, Rev A, dated November 15, 2002 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

(c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

(d) Within 90 days after starting activities granted by this approval, a procedure must be provided to

WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the applicable standards the WDOH Code Compliance Matrix for LAB HVAC Systems, 24590-LAB-RPT-ENG-02-001, Rev A, dated November 15, 2002 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The total number of samples received annually in the analytical laboratory shall not exceed 6000 samples with an average sample volume not exceeding 15 ml. [WAC 246-247-030(5); WAC 246-47-110 (10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997".

Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080 (7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges;

-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

40) The differential pressure across each HEPA filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH for approval. [WAC 246-247-120]

41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

42) If electrical power to operate exhaust fans for this emission unit fails, normal operations within this emission unit with the potential to produce particulates shall cease until power is restored. [WAC 246-247-120]

43) The following monitoring requirements are based on emissions estimated presented in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. Emission unit LB-S2 shall be continuously monitored. Radionuclides which contribute 10% of the unabated dose or greater, produce a unabated dose of 0.1mrem/yr, and radionuclides that contribute 25% of the abated dose or greater shall be sampled, analyzed, and reported. This shall include at a minimum analyses for gross alpha and gross beta/gamma.

Prior to hot commissioning, the procedure to manage down time or failure time of continuous sampling and monitoring equipment will be developed and submitted to WDOH for review and approval. [WAC 246-247-040(1); WAC 246-247-075]

44) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

45) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

46) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

Approval Number: AIR 03-1014 NOC ID: 511

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) LAW VITRIFICATION PLANT

Emission Unit Name: LV-S3 **Emission Unit ID** 547

This is a MAJOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT**

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	Film Cooler	2	One in operation and one in standby.
	Submerged Bed Scrubber	1	One in operation.
	Wet Electrostatic Precipitator	1	One in operation.
	Injection Air	1	Operational from process vessel vent.
	Heater	2	One in operation and one in standby.
	HEPA	2	Two stages of HEPA filtration. A total of two banks of primary HEPAs one in operation and one in standby. Each bank contains six filters. A total two banks of secondary HEPAs one in operation and one in standby. Each bank contains six filters.
	Exhaust Fan	3	One or two in operation depending on one or two melters in operation. One in standby.
	Caustic Scrubber	1	One in operation.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Am-241, Co-60, Cm-244, Cs-137, C-14, Eu-152, Eu-154, I-129, Np-237, Pu-238, Pu-239, Pu-240, Pu-241, Sb-125, Sr-90, Tc-99, Th-232, U-233, U-234, Y-90, Ru-106, Ra-226, U-232, Pa-231, Ac-227 and Th-229	Continuous

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

Printed on: 22-Oct-03

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

the receipt of low-activity waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit LV-S3 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a film cooler, a Submerged Bed Scrubber (SBS), a Wet Electrostatic Precipitator (WESP), an injection of air delivered through a Vessel Vent Header (S52 Stream), a Heater, two stages of High-Efficiency Particulate Air (HEPA) filtration in series, Exhaust Fans, and a Caustic Scrubber. Control technologies for operation of the emission unit that are not regulated by this license (located between the Exhaust Fans and the Caustic Scrubber) are a Heat Exchanger, a Heater, a Thermal Catalytic Oxidizer, two Selective Catalytic Reduction units in series, and back through the Heat Exchanger.

The maximum differential pressure across each filter HEPA bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

The inlet airstream temperatures for each HEPA filter bank shall be measured by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The temperature differential shall be controlled to ensure Relative Humidity (RH) is within acceptable limits. The moisture content of the inlet airstream for each HEPA filter bank shall be measured by a capacitive moisture sensor that is specified to be tolerant of particulate contamination and most chemicals. The dewpoint of offgas air flow shall be measured and subsequently controlled by temperature to ensure that the air stream is above its dewpoint in order to prevent condensation in offgas treatment equipment such as HEPA filters. The various component selections for moisture sensor instruments shall be based on factors that include range, accuracy, offgas stream constituents, and radiation levels.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to the following:

-Transfer of the LAW melter feed to the LAW melter with air displacement slurry pumps;
-Melting of the glass formers and radioactive melter feed in the LAW melters;
-Discharge of melted glass to waste canisters;
-Waste canister filling.

Detailed descriptions of activities in the areas ventilated by this emission unit will be provided to WDOH prior to cold commissioning. The WDOH reserves the right to determine if changes in this process description constitute a significant modification under WAC 246-247-030 (16) & (25). [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110(10,11,12,13,14,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110(5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) & (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) & (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design

plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of regulated systems, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6)WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10).

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

    Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the "Washington Sate Department of Health Code Compliance Matrices for the Waste Treatment Plant Process Gas Treatment Systems, 24590-WTP-RPT-ENG-02-015, Rev.

B. dated November 04, 2002. [WAC 246-247-120]

b) Emission unit components design, construction, testing, and operation different from those identified in "Washington Sate Department of Health Code Compliance Matrices for the Waste Treatment Plant Process Gas Treatment Systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002, are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the applicable standards the "Washington Sate Department of Health Code Compliance Matrices for the Waste Treatment Plant Process Gas Treatment Systems, 24590-WTP-RPT-ENG-02-015, Rev. B, dated November 04, 2002, shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, valves, piping, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The annual ILAW production from the LAW plant shall not exceed 1.825 E4 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110 (10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration

damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080(7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges;
-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The USDOE shall provide manufacturer's specifications and/or research and development data, including published removal efficiencies and installation requirements, to demonstrate to WDOH that the Submerged Bed Scrubber, Wet Electrostatic Precipitator, and Caustic Scrubber in this emission control unit are intended to operate at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. This information shall be provided to the WDOH at least 90 days prior to hot commissioning.

Where actual measurements are impossible, the USDOE shall provide to the WDOH for approval prior to hot startup sufficient information to demonstrate that the control equipment has been installed in accordance with manufacturers' specifications. Where the application depends on research and development data, the USDOE shall provide to the WDOH for approval prior to hot startup sufficient information to demonstrate that the control equipment has been installed in a manner consistent with the conditions under which the research and development data was obtained. [WAC 246-247-120]

40) The differential pressure across each filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

41) If temperatures of air entering the HEPA filters exceed the manufacturer's recommendations for the filters, WDOH shall be notified and the cause of the temperature excursion shall be determined. HEPA filters shall be evaluated for the need to be replaced. [WAC 246-247-120]

42) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

43) The USDOE shall notify the WDOH before initiating use of the maintenance ventilation bypass line for the Submerged Bed Scrubber (SBS) and the Wet Electrostatic Precipitator (WESP). Prior to initiating use of the maintenance ventilation bypass line for the SBS and the WESP, waste feed to the LAW Melter shall be halted, and the melter shall be placed into an idle condition. All emissions control system components for emission unit LV-S3 shall remain online for sufficient time after initiation of melter idling to allow the cold cap to burn off. Waste feed to the melter shall be halted when the maintenance bypass line for the SBS and WESP is in use. While the SBS/WESP maintenance bypass line is in use, offgas shall be treated with all other emission control systems for emission unit LV-S3, including the HEPA filtration, and caustic scrubber. Temperature of the offgas air stream incident to system HEPA filters shall be sufficiently low (less than 100 degrees C) to ensure that cesium-137 and technetium-99 are in aerosol form and are captured by the HEPA filters.

Prior to hot commissioning, appropriate procedures to initiate this by-pass system shall be established and documentation describing these procedures shall be presented to WDOH for review and approval. [WAC 246-247-120]

44) The USDOE shall notify the WDOH before initiating use of the maintenance ventilation bypass line for the LAW Caustic Scrubber. Prior to initiating use of the maintenance ventilation bypass line for the LAW Caustic Scrubber, waste feed to the LAW Melter shall be halted, and the melter shall be placed into an idle condition. All offgas emissions control system components for emission unit LV-S3 shall remain online for sufficient time after initiation of melter idling to permit the cold cap to burn off and to finish for iodine-129 offgassing. Waste feed to the melter shall be halted when the maintenance bypass line for the LAW Caustic Scrubber is in use. While the LAW Caustic Scrubber maintenance bypass line is in use, offgas shall be treated with all other emission control system components for emission unit LV-S3, including the SBS, WESP, and HEPA filtration.

Prior to hot commissioning, appropriate procedures to initiate this by-pass system shall be established, and documentation describing these procedures shall be presented to WDOH for review and approval. [WAC 246-247-120]

45) The USDOE shall notify the WDOH before initiating replacement of a melter unit in the LAW. Prior to initiating replacement of the melter unit, waste feed to the LAW Melter shall be halted, and the melter shall be placed into an idle condition. All emissions control system components for emission unit LV-S3 shall remain online for a minimum period of time after initiation of melter idling to allow the cold cap to burn off. Prior to hot commissioning, appropriate procedures to initiate replacement of a failed melter shall be established, and documentation describing these procedures shall be presented to WDOH for review and approval. [WAC 246-247-120]

46) External surface smearable contamination concentrations for failed LAW melters package being removed from the facility for storage and/or disposal shall not exceed 1000 dpm/100 cm2 for beta/gamma emitters or 20 dpm/100 cm2 for alpha emitters. [WAC 246-247-110(10,11,12,13)]

47) The differential pressure across the submerged bed scrubber shall be monitored, recorded, and trended. Prior to hot commissioning, parameters appropriate for measuring the performance of the SBS and operating ranges for these parameters shall be established and presented to WDOH for approval. [WAC 246-247-120]

48) The pH of the caustic scrubber fluid shall be monitored, recorded, and trended during operation. Prior to hot commissioning, parameters appropriate for measuring the performance of the caustic scrubber and operating ranges for these parameters shall be established and presented to WDOH for approval.

[WAC 246-247-120]

49) Uninterrupted electrical power with subsequent alternate power supplied by on-site generators shall be available for the offgas exhausters upon loss of normal facility electrical power. [WAC 246-247-120]

50) The WDOH shall be notified prior to installation of the mechanical reamer for the LAW film cooler. [WAC 246-247-120]

51) Emission unit LV-S3 shall be continuously monitored. Radionuclides which contribute 10% of the unabated dose or greater, or produce an unabated dose of 0.1mrem/yr, and radionuclides that contribute 25% of the abated dose or greater shall be sampled, analyzed, and reported. The LV-S3 emission unit sampling system shall be designed to analyze at a minimum the following radionuclides: Am-241, Co-60, Cm-244, Cs-137, C-14, Eu-152, Eu-154, I-129, Np-237, Pu-238, Pu-239, Pu-240, Pu-241, Sb-125, Sm-151, Sr-90, Tc-99, Th-232, U-233, U-234, Y-90, Ru-106, Ra-226, U-232, Pa-231, Ac-227, Th-229.

Prior to hot commissioning, the procedure to manage down time or failure time of continuous sampling and monitoring equipment will be developed and submitted to WDOH for review and approval. [WAC 246-247-040(1); WAC 246-247-075]

52) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

53) A new air sampling station shall be established at a distance of approximately 1500 meters in the ESE direction from WTP. This sampling station is hereinafter called the "New Station".

54) The following ambient air sampling stations shall be operated as a monitoring network, with all sampling, analysis, interpretation, and reporting to managed as a single entity: a) the New Station, b) Vit Plant North, c) B Pond, d) 200 ESE, e) N-977, f) N-985, g) N-158, h) N-984, i) N-498, j) N-499, k) West End Fir Road.

55) At all 11 of these stations the following air sampling regime shall be conducted: a) gross alpha/gross beta samples shall be collected on a bi-weekly basis (particulate air filters operated for two-week periods); b) particulate air samples shall be composited on a monthly basis and analyzed by gamma scan for the following radionuclides: Ru-106, Sb-125, Cs-134, Cs-137, Eu-154, and Am-241, plus any other radionuclides with positive activities greater than the MDA; and c) particulate air samples shall be composited on a quarterly basis and analyzed with appropriate radiochemical methods for Sr-90 and Pu-239-240.

56) At the New Station, the Station at 200 ESE, and the Station at the West End of Fir Road, the following additional air samples shall be collected: a) tritium samples shall be obtained with silica gel or molecular sieve filters, collected approximately monthly, and the extracted moisture shall be analyzed by liquid scintillation; b) continuous air samples shall be collected on a monthly basis with appropriate sample media and analyzed with appropriate radiochemical techniques for C-14; and c) continuous air samples shall be collected with appropriate media and combined on a quarterly basis to be analyzed with appropriate radiochemical techniques for I-129.

57) Sampling and sample analysis regimes used for WTP ambient air monitoring shall meet or exceed the following minimum detectable concentrations over the above specified sampling periods:

ANALYSIS	Minimum Detectable Concentration
Gross Alpha:	0.001 pCi/m3
Gross Beta:	0.003 pCi/m3

Tritium:	3 pCi/m3
Strontium-90 :	0.0001 pCi/m3
Iodine-129 :	0.00001 pCi/m3
Gamma Scan (137Cs) :	0.01

58) Preoperational monitoring shall be performed to obtain a baseline of all analytes prior to commencement of processing of radioactive waste at the WTP. A baseline dataset of 12 contiguous months of validated data shall be provided to WDOH for review and approval.

59) The operational status of the data management system for collecting, validating, and evaluating WTP ambient monitoring data shall be demonstrated to WDOH by providing in report form the baseline dataset of 12 contiguous months of validated data of all analytes for review and approval.

60) Validated gross beta sample results from all 10 stations shall be reported within 30 days of sample collection, and all data shall be promptly analyzed for trends.

61) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

62) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

63) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas ventilated by emission unit LV-S3. [WAC 246-247-120]

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) LAW VITRIFICATION PLANT

Emission Unit Name: LV-C2 **Emission Unit ID** 548

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT** ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	One stage of HEPA filtration. A total of ten banks of primary HEPAs nine in operation and one in standby. Each bank contains six filters.
	Exhaust Fan	2	Two in operation.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Gross Alpha and Gross Beta/Gamma	Shall be determined prior to cold commissioning

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26, 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes, AIR 03-1014, mailed on October 23, 2003.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

the receipt of low-activity waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit LV-C2 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a single stage of High-Efficiency Particulate Air (HEPA) filtration, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

Space temperatures from which C2 air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The C2V exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval.

The approved activities are limited to the following:

-Transport of bagged failed manipulator for repair within C3 workshop;
-Transport of packaged failed melter for storage at the Balance-of-Facilities (BOF)
-Transport of packaged melter consumables;
-Transport of containerized failed equipment for storage at the BOF;
-Transport of containerized miscellaneous wastes for storage at the BOF;
-Transport of process samples via autosampler;
-Transport of Personal Protective Equipment;
-Filter changeout, aerosol testing, and transport of spent filters;

-Exhaust Fan maintenance.

Detailed descriptions of activities in the areas ventilated by this emission unit will be provided to WDOH prior to cold commissioning. The WDOH reserves the right to determine if changes in this process description constitute a significant modification under WAC 246-247-030 (16) & (25). [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)]

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110 (10,11, 12, 13, 14, 15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110 (5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040(3) & (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040(3) & (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040(3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received

from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6); WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10).

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13)]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the

shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002" and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003. [WAC 246-247-120]

b) Emission unit components design, construction, testing, and operation different from those identified in WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002" and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the applicable standards the WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002" and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans, dampers, ductwork, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The annual LAW production from the LAW plant shall not exceed 1.825 E4 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110 (10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%. [WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080 (7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

-provide critical operating parameters;
-develop acceptable operating ranges;
-develop operating procedures to monitor and maintain these parameters;

-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14 June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

40) The differential pressure across each filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation. Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

42) Surface concentrations of smearable contamination for surface areas within C2 ventilation areas shall not exceed 1,000 dpm/100 cm2 for beta/gamma emitters or 20 dpm/100 cm2 for alpha emitters. [WAC 246-247-110(10,11,12,13)]

43) The USDOE shall perform radiation surveys on at least a quarterly basis of the smearable surface radioactive contamination of exposed surface areas ventilated by emission unit LV-C2. The USDOE shall use the data from these surveys to demonstrate that the annual average surface concentration of beta/gamma emitters does not exceed 1000 dpm/100 cm2 over a surface area of 2165 m2, and that the annual average surface concentration of alpha emitters does not exceed 1000 dpm/100 cm2 over a surface area of 2165 m2 .[WAC 246-247-110(10,11,12,13)]

44) Differential pressures shall be monitored between C2 and C3 areas to ensure air flow is from the C2 to C3 areas. [WAC 246-247-120]

45) Interlocks shall be in place to prevent operation of the LV-C2 emission unit upon loss of power to the C3 ventilation. [WAC 246-247-120]

46) For emission unit LV-C2, periodic confirmatory sampling for particulates shall be performed, with analyses for gross alpha and gross beta/gamma. [WAC 246-247-040(1); WAC 246-247-075]

47) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040(1); WAC 246-247-075]

48) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

49) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

50) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas ventilated by

emission unit LV-C2. [WAC 246-247-120]

51) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
NOTICE OF CONSTRUCTION
APPROVAL FOR

PROJECT TITLE: CONSTRUCTION OF (WTP) LAW VITRIFICATION PLANT

Emission Unit Name: LV-S1 **Emission Unit ID** 549

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: **BARCT** ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	One stage of HEPA filtration. A total of ten banks of primary HEPAs nine in operation and one in standby. Each bank contains four filters.
	Exhaust Fan	2	One in operation and one in standby.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075	Appendix B, Method 114(3) and (4)	Gross Alpha and Gross Beta/Gamma	Shall be determined prior to cold commissioning

Sampling Requirements: Record Sampling

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

12/05/2002 NOC received June 26 2002. Draft Conditions and Limitations, AIR 03-1011, mailed on October 13, 2003. Draft Conditions and Limitations accepted on October 20, 2003. Final approval with some typographical changes, AIR 03-1014, mailed on October 23, 2003.

CONDITIONS AND LIMITATIONS

1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).

2) This emission unit does not have an abated PTE. This emission unit does not have an unabated PTE.

3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**

the receipt of low-activity waste feed from the Pretreatment Facility and conversion of the waste slurry and glass formers into molten glass. See process descriptions listed below for the individual emission units.

4) This NOC does not have "Annual Possession Quantity" limits.

5) The WDOH has determined that BARCT for emission unit LV-S1 is a system comprising the following control technology, ancillary equipment, protective features, and protective equipment, in the following order: a single stage of High-Efficiency Particulate Air (HEPA) filtration, and Exhaust Fans.

The maximum differential pressure across each HEPA filter bank shall be measured by capacitive pressure sensors.

A minimum differential pressure measurement combined with a calculated total airflow shall be used to check for HEPA Filter bypass. Airflow shall be measured and monitored at the exhaust stack by air pressure probes located to effectively read average air velocity pressure and extract a total airflow. Loss of differential pressure without a coincident reduction in airflow is indicative of filter bypass.

Space temperatures from which C3 air is exhausted shall be measured as the inlet airstream temperature for each HEPA filter bank by platinum based resistance temperature detectors (RTDs). Thermocouples shall be used in less critical or in higher temperature streams, with careful attention to the design issues to avoid misapplication.

The C3V exhaust air stream temperature shall at all times be above the dewpoint, therefore Relative Humidity (RH) for this emission unit shall not be a required HEPA operating parameter nor shall an indication device be required. Should design or operations change in such a way that RH becomes a key operating parameter for the HEPA banks of this emission unit, an indication device shall be required prior to implementing the change.

Prior to cold commissioning the BARCT process must be completed for approval by WDOH for all indication devices and parameters for all the required BARCT controls and protective features of this emission unit.

Prior to the receipt of waste material the operating ranges for each of the indication devices for all the required BARCT controls and protective features of this emission unit must be provide to WDOH for approval. [WAC 246-247-030(6); WAC 246-247-040(3); WAC 246-247-120]

6) No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to the following:

exhaust fan maintenance; tool maintenance; manipulator repair; valve repair; CCB repairs; decontamination activities; bulge preventative maintenance.

Detailed descriptions of activities in the areas ventilated by this emission unit will be provided to WDOH prior to cold commissioning. The WDOH reserves the right to determine if changes in this process description constitute a significant modification under WAC 246-247-030 (16) & (25). [WAC 246-247-110(5); WAC 246-247-110(8); WAC 246-247-110(10); WAC 246-247-110(13)].

7) These Conditions and Limitations apply only to the construction of the emission unit and do not allow operation of the emission unit. Prior to operation of this emission unit under "hot commissioning

activities" additional conditions and limitations must be obtained from WDOH. [WAC 246-247-060(1)]

8) A minimum of one year prior to cold commissioning of the Waste Treatment Plant, the licensee shall recalculate radionuclide feed rates, annual possession quantities, release rates, source terms, and MEI doses for all WTP emission units and submit this information to WDOH together with a request for permission to commence waste processing. The WDOH shall consider this information prior to issuing a license to operate. The license to operate shall contain such additional conditions and limitations as WDOH shall deem necessary and appropriate. [WAC 246-247-110 (10,11,12,13, 4,15)]

9) DOE and its contractor are fully liable for the design of the Waste Treatment Plant to comply with all applicable laws and regulations and to keep commitments made in all applications to construct under WAC 246-247, including designs completed and proposed to the WDOH and portions not yet designed. [WAC 246-247-110 (5)]

10) DOE shall construct the Waste Treatment Plant at its own risk. DOE shall remove or alter any control technology components, and/or any, foundations, support systems, or ancillary construction which are later found not to be in compliance with the applicable standards referenced in WAC 246-247-040 or which are not in compliance with conditions and limitations developed in the WTP permitting process. [WAC 246-247-040 (3) & (4)]

11) Any additional licensing necessitated by plant design changes may require additional or different controls for radioactive air emissions. A needed change in the footprint of the plant based on these needs shall not be considered justification for not installing the required controls. [WAC 246-247-040 (3) & (4)]

12) Approval of BARCT and operational procedures for the Waste Treatment Plant are based on the design plant radioactive waste processing capacity as estimated in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant," BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev. 1, dated 14 June 2002. The Washington Department of Health reserves the right to require additional control technology and/or monitoring, different emissions limits, and different or additional conditions, and limitations in the case that future plant design changes should result in significantly different design radioactive waste throughput.

    Any changes in the design which constitute an increase in radioactive air emissions potential-to-emit subsequent to this approval may, at WDOH's discretion, constitute a modification of the facility, as defined by WAC 246-247-030(16), requiring additional licensing, including a resubmittal of BARCT and a new NOC. [WAC 246-247-040 (3)]

13) Conditions and Limitations for construction activities must be documented in an established procedure matrix or commitment matrix database within 90 days after full construction authorization is received from WDOH. The procedure matrix or commitment matrix database for operational conditions shall be completed no later than 180 days before receipt of radioactive waste into the WTP to start Hot Commissioning and identify the specific procedures which will satisfy the Conditions and Limitations. This requirement may be satisfied for such of these Conditions and Limitations as are related only to the operational phase of radioactive waste processing (as opposed to the construction of the facility) by descriptions of specific procedures which will be completed no later than 90 days prior to the hot commissioning of the facility. [WAC 246-247-040(5); WAC 246-247-060(5); WAC 246-247-075(6); ASME NQA-1-1997]

14) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction

or operation, the department reserves the right to require modifications to bring it into compliance. [WAC 246-247-060-(2)(d)]

15) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. Prior to commencement of testing of a regulated system, the WTP shall provide a schedule for testing of all regulated components of that system to WDOH. The department reserves the right to observe such tests. [WAC 246-247-060(4)]

16) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards. [WAC 246-247-040(5); WAC 246-247-060(6)WAC 246-247-075(6); 40CFR61.93(b)(2)(iv); 40CFR61, Appendix B, Method 114]

17) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10).

18) The facility must be able to demonstrate that workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures. [WAC 246-247-075(12)]

19) The facility must be able to demonstrate the reliability and accuracy of emissions data from this emission unit. [WAC 246-247-075(13]

20) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter. [WAC 246-247-080(1)]

21) The department may require an ALARACT demonstration at any time. [WAC 246-247-080(1)]

22) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. [WAC 246-247-080(2)]

23) The facility shall report all measured or calculated emissions annually. [WAC 246-247-080(3)]

24) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5). [WAC 246-247-080(5)]

25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity shall not be considered permanently shut down or completed until a report of closure is received and approved by the Department of Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting requirements which are no longer applicable for that emission unit or activity. All records, relating to the shut down emission unit or

completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8). [WAC 246-247(6) and (8)]

26) All facilities must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine effective dose equivalent. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the WDOH. [40 CFR 61.95; WAC 246-247-080(8)]

27) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection. WDOH inspectors shall be allowed to use audio/visual equipment to document inspections. [WAC 246-247-080(9)]

28) The facility shall make available, in a timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The USDOE shall allow access to classified documents by representatives of the department with the appropriate clearance and demonstrable need-to-know. [WAC 246-247-080(10)]

29) (a) The DOE shall ensure all emission unit components, design, construction, testing and operation shall be carried out as described in the WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002" and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003. [WAC 246-247-120] [WAC 246-247-120]

(b) Emission unit components design, construction, testing, and operation different from those identified in WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002" and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated June 5, 2003 are not approved, and if carried out, are at risk of enforcement action pursuant to WAC 246-247-100. [WAC 246-247-120]

(c) Should a deviation to a standard be identified after start of construction, WDOH approval of the deviation shall be obtained prior to installation of the system or component. The procedure for the compliance matrices maintenance shall be followed in this event. [WAC 246-247-120]

(d) Within 90 days after starting activities granted by this approval, a procedure must be provided to WDOH identifying how the compliance matrix outlining compliance with the control technology standards shall be maintained and updated. [WAC 246-247-120]

30) Prior to installation of the following ventilation components, complete documentation verifying compliance with the applicable standards the WDOH Code Compliance Matrix for LAW HVAC System, 24590-WTP-RPT-ENG-02-001, Rev. A, dated November 15, 2002" and the WTP Cost Benefit analysis for C2 and C3 HVAC Systems, 24590-WTP-RPT-HV-02-001, Rev. 0, dated Jun 5, 2003 shall be made available for review and approval by WDOH: HEPA filter housing, exhaust fans,

dampers, ductwork, and indication devices. [WAC 246-247-120]

31) The monitoring system for this emission unit shall be designed and operated in full compliance to ANSI N13.1-1999. Prior to installation of emission unit monitoring systems final design of the monitoring systems shall be provided to WDOH for review and approval. [WAC 246-247-075(2); WAC 246-247-120; 40 CFR Part 61.93]

32) The annual ILAW production from the LAW plant shall not exceed 1.825 E4 metric tons/year, based on glass as the waste form. [WAC 246-247-030(5); WAC 246-47-110 (10)]

33) HEPA filters shall be tested in-place after installation and at least annually thereafter. The test shall be performed in accordance with Section TA of "Code on Nuclear Air and Gas Treatment, ASME AG-1-1997". Tests shall demonstrate that each filter bank has a removal efficiency no less than 99.95%.[WAC 246-247-120]

34) Radial flow HEPA filter qualification certification testing must be performed by an independent test facility in accordance with the requirements of "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. Prior to installation of the radial flow HEPA filters that are installed for hot commissioning, the certification test results shall be provided to WDOH for qualification concurrence of the radial flow HEPA filters to "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", Section FC-5100. [WAC 246-247-120]

35) Total design flow through each HEPA filter bank shall not exceed the maximum rated flowrate for the individual HEPA filters multiplied by the number of filters in the bank.

The actual flowrate through each filter bank shall be verified and results of this demonstration shall be presented to WDOH for approval prior to hot startup. [WAC 246-247-120]

36) The USDOE shall develop, and submit to WDOH for approval, criteria for an annual USDOE inspection of the overall system integrity of this unit (e.g., corrosion damage, leakage, vibration damage, structural damage, and component deterioration). This inspection shall include determination of need for any replacements. A log of inspection findings shall be maintained in a format approved for this emission unit by the WDOH. [WAC 246-247-120]

37) USDOE shall provide to WDOH for approval a proposal for tracking the annual possession quantity (APQ) for this emission unit to WDOH prior to hot commissioning. [WAC 246-247-080 (7)]

38) For the equipment identified as control technology, ancillary equipment, protective features, and protective equipment under this approval, the USDOE shall:

- provide critical operating parameters;
-develop acceptable operating ranges;
-develop operating procedures to monitor and maintain these parameters;
-provide descriptions of procedures to WDOH for review and approval.

These actions shall be completed prior to receiving approval for accepting radioactive material into the WTP. [WAC 246-247-120]

39) The USDOE shall provide test results to demonstrate to the WDOH that HEPA filters in this emission control unit are operating at design removal efficiency or decontamination factor, as specified in the "Radioactive Air Emissions Notice of Construction Permit Application for the River Protection Project - Waste Treatment Plant ", BNI Document Number 24590-WTP-RPT-ENV-01-008, Rev.1, 14

June 2002. The results of these tests shall be provided to the WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

40) The differential pressure across each filter bank shall be monitored, recorded, and trended. Specifications for instrumentation shall be provided to WDOH prior to installation.

Prior to hot commissioning, the range of differential pressure which shall be maintained across the HEPA filter bank shall be provided to WDOH. [WAC 246-247-120]

41) Prior to cold commissioning, the USDOE shall provide documentation to the WDOH for approval to demonstrate that humidity in the airstream entering the HEPA filter bank shall be maintained below the manufacturer's specified maximum. [WAC 246-247-120]

42) Surface concentrations of smearable contamination for surface areas within C3 ventilation areas shall not exceed 100,000 dpm/100 cm2 for beta/gamma emitters or 1000 dpm/100 cm2 for alpha emitters. [WAC 246-247-110 (10,11,12,13)]

43) The USDOE shall perform radiation surveys on at least a quarterly basis of the smearable surface radioactive contamination of exposed surface areas ventilated by emission unit LV-S1. The USDOE shall use the data from these surveys to demonstrate that the annual average surface concentration of beta/gamma emitters does not exceed 100,000 dpm/100 cm2 over a surface area of 270 m2 , and that the annual average surface concentration of alpha emitters does not exceed 1000 dpm/100 cm2 over a surface area of 270 m2 . [WAC 246-247-110 (10,11,12,13)]

44) If electrical power to operate exhaust fans for this emission unit fails, normal operations within this emission unit with the potential to produce particulates shall cease until power is restored. [WAC 246-247-120]

45) Differential pressures shall be monitored between C2 and C3 areas to ensure air flow is from the C2 to C3 areas.

Differential pressures shall be monitored between C3 and C5 areas to ensure air flow is from the C3 to C5 areas. [WAC 246-247-120]

46) Interlocks shall be in place to prevent operation of the LV-S1 emission unit upon loss of power to the C5 ventilation. [WAC 246-247-120]

47) Backflow dampers between C3 and C5 ventilation systems must comply with "AMCA Publication 500 . Permission to use this standard in this application is based on information submitted to WDOH by the WTP on Dec. 17, 2002. [WAC 246-247-120]

48) For emission unit LV-S1, periodic confirmatory emissions sampling for particulates shall be performed, with analyses for gross alpha and gross beta/gamma. [WAC 246-247-040 (1); WAC 246-247-075]

49) Analysis and quality assurance of stack sampling shall follow the requirements of 40 CFR 61 Appendix B Method 114 sections 3 and 4. [WAC 246-247-040 (1); WAC 246-247-075]

50) All HEPA filter banks in this unit's emission control system shall be subjected to aerosol penetration tests in accordance with "CODE ON NUCLEAR AIR AND GAS TREATMENT, ASME AG-1-1997", and the results of these tests shall be provided to WDOH at least 90 days prior to hot commissioning. [WAC 246-247-120]

51) Air sample transport lines shall be designed to prevent moisture condensation within the lines. Design details shall be provided to WDOH prior to cold commissioning. [WAC 246-247-120]

52) Volume reduction equipment ("HEPA Compactors") shall not be incorporated into areas ventilated by emission unit LV-S1. [WAC 246-247-120]

53) WTP shall identify maintenance activities that will require localized controls for particulates. Design details of the controls shall be provided to WDOH for approval prior to hot commissioning. [WAC 246-247-120]